FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

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Founder and Editor: STANLEY SPOONER

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1929.

Aug. 28 .... **Clacton-on-Sea, Air Display.**

Aug. 31-Sept. 1 **International Air Rally, Hadleigh, Suffolk.**

Sept. 6-7 .... **Schneider Trophy Race, Solent.**

Sept. 10-20 **Aero Club de France Meeting, Le Baule.**

Sept. 21 .... **Air Rally at Haldon, Teignmouth.**

Sept. 22 .... **Bristol Aeroplane Club's Aerial At Home.**

Oct. 1 .... **Gordon-Bennett Balloon Race, St. Louis, U.S.A.**

Oct. 5 .... **Newcastle Air Pageant, Cramlington Aerodrome.**

Oct. 10 .... **Air Pageant and Light 'Plane Race, Hull Municipal Aerodrome.**

Oct. 31 .... **Guggenheim Safe-Aircraft Competition Closes.**

EDITORIAL COMMENT

WE in this country and in the British Empire have, perhaps, a more vital interest in long-distance flying than has any other country. Whereas rapid communications are a convenience to any country, they are a sheer necessity to the peoples of the British Commonwealth of Nations. For that reason it behoves us to follow as closely as possible anything likely to influence or have a bearing upon the future development of long-distance flying, be it by heavier-than-air or by lighter-than-air craft. The recent flight of the

Airships

Graf Zeppelin from Friedrichshafen to Tokyo must have focussed once more the eyes of the world upon Germany and German air activities, and doubtless the world in general is saying, as it did when the German liner *Bremen* beat the record for the crossing of the Atlantic by surface vessels: "What wonderful people those Germans are." And quite rightly so. It is an undoubted fact, as anyone will know who travels considerably abroad and has an opportunity to hear the views there expressed, that such feats do impress the general public quite a good deal, and it would be unwise for us at home to ignore the fact. FLIGHT has never looked with favour upon senseless "stunts," such as attempts to cross the Atlantic in landplanes unsuitable for the purpose. But when a really fine performance is put up, and one which is in addition of definite practical value, we are the first to applaud the feat, be it achieved by our own people or by foreigners. And the flight of the *Graf Zeppelin* to Tokyo was undoubtedly a very splendid piece of work, which is bound to act as a stimulus to flying, not only in Germany but also elsewhere.

To us in Great Britain and all over the British Empire the flight is rendered all the more valuable on account of the approach of the completion of the two new large British rigid airships R.100 and R.101, which are now being finished at Howden and Cardington respectively. These two airships, larger by some 50 per cent. than the *Graf Zeppelin*, are intended for use, experimentally at first and, if all goes well, more or less regularly afterwards,

on air routes of the British Empire. Consequently any information which becomes available, and any experience the results of which are applicable to our own conditions, is of the greatest possible interest in the meantime. We believe we are right in stating that Cardington has previously received very valuable information and advice from the Zeppelin works at Friedrichshafen, and doubtless some of the practical information collected by Dr. Eckener and his crew on this flight will be as willingly passed on to Maj. Scott and Col. Richmond as have previous data. To the layman much of this information would be more or less unintelligible, and doubtless very uninteresting, but to the technicians it may be of the greatest value. The *Graf Zeppelin* is a good deal smaller than our new airships, and its construction is totally different. But the fundamental principles are the same, and apply equally well in both cases.

Doubtless the antagonists of airships will derive much satisfaction from the fact that of the people on board during the flight of the *Graf Zeppelin* approximately two-thirds were crew and one-third were passengers, and will ask with great glee what would be the use of an ocean liner which had to carry a crew twice as numerous as the number of passengers. The answer to that is, of course, that if a regular airship route between Germany and Japan existed, there might be a very different proportion between crew and passengers. Also, on very few regularly-operated airship routes of the future will such great distances be demanded. Consequently a smaller quantity of fuel would be carried, with corresponding increase in the weight of pay load which could be transported. After its first double crossing of the Atlantic, when the *Graf Zeppelin* narrowly escaped disaster, Dr. Eckener is reported to have expressed the view that the airship is not really suitable for such journeys. Yet he has had enough confidence in the ability of the airship to undertake a much longer voyage, although the last cruise has been entirely over land. And by his safe arrival at Tokyo he has proved his confidence well founded. It must be admitted that the flight does not produce definite proof that the trip could *always* be made, under any weather conditions, and guaranteed to run to schedule time. But history has shown time after time that what can be accomplished experimentally under favourable conditions to-day can usually be achieved with safety and regularity, figuratively, tomorrow or the next day. Thus we may, from the flight of *Graf Zeppelin* and without claiming proofs which it has not given, justifiably hope that, with further advance in technique, such as that already incorporated in our latest airships, and such other improvements as subsequent ships will undoubtedly contain, the possibilities of regular operation of airship services over long routes exists, and that they are worth exploring to the best of our ability. And it is for that reason we welcome the flight of Dr. Eckener and his companions, and wish them every possible good fortune on the remaining sections of their journey.

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Appointment of New Chief of the Air Staff

The Air Ministry announces :—His Majesty the King has been pleased to approve the appointment of Air Chief Marshal Sir John M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C., to succeed Marshal of the RoyalAir Force Sir Hugh Trenchard, Bart., G.C.B., D.S.O., as Chief of the Air Staff, with effect from January 1, 1930. Sir John Salmond was born in 1881. In 1914 he was in command of a R.F.C. squadron, and received rapid promotion. In 1917 he was appointed General Officer Commanding Royal Air Force, France. From 1920-22 he was Air Officer Commanding the Inland Area, R.A.F. In October, 1922, he was appointed the first air officer to command the British forces in Iraq, and in recognition of his services there was promoted Air Marshal in 1923. On returning to England he was appointed Air Officer Commanding-in-Chief, Air Defence of Great Britain. His appointment as Air Chief Marshal was announced in January, following his return from Australia, where he went to advise the Commonwealth Government on the air defence of the Commonwealth and the organisation of the Royal Australian Air Force.

Hull's Municipal Aerodrome

At a meeting on August 20, of the Hull Corporation Aerodrome Committee, presided over by the Lord Mayor (Councillor Pearlman), the proposed municipal aerodrome for Hull was discussed. Since the Hull Corporation agreed to purchase the old racecourse near Hedon, four miles east of Hull, as the site for the aerodrome, an adjacent site has been acquired for the erection of a gasworks for the East Hull Gas Company. If the scheme for the gasworks is proceeded with it is probable that the Air Ministry will withhold the licence for the aerodrome. The meeting was held in private. Afterwards the town clerk stated that the committee had authorised the opening of negotiations with the gas company. The Lord Mayor added that he hoped that it would be possible to hold the air pageant on October 10 in connection with the Hull Civic Week, which Prince George has consented to declare open.

Rush on London-Paris Air Services

To cope with the crowds of holiday-makers anxious to travel to the Continent by air last Saturday, Imperial Airways had to duplicate their services between London and Paris. Over 2,000 people are now flying across the Channel every week.

Sir Sefton Brancker's Tour

On August 17, Sir Sefton Brancker landed at Vienna in the course of his tour in a De Havilland " Moth," with the object of studying Continental air ports.

Air Mails from Ireland

We have reported in recent issues the proposal to carry air mails from Galway to London after they have arrived from America in the North German Lloyd liner *Karlshruhe*. The machine which will be used is a Vickers " Vivid " biplane, fitted with a Napier " Lion XIa " engine, and has been loaned to Irish Airways, Ltd., by Sir Robert McLean, Chairman of Vickers (Aviation), Ltd. Col. Russell, of Irish Airways, Ltd., together with Flying Officer J. Summers, of Vickers (Aviation), Ltd., will be the two pilots, and they left Weybridge for Baldonnel aerodrome on August 21.

Fokker Seaplane for Forestry Patrol

A new Fokker super-universal seaplane, purchased from Canadian Vickers, Ltd., Montreal, by the Pigeon Timber Company of Port Arthur, arrived there on July 26, and is to be used for the purpose of cruising, air patrol and fire protection in respect of the company's extensive timber areas.

Canada

Incorporation under Federal Charter has recently been completed of the Canadian Flying Service, Ltd., which will operate in Toronto. The capital is 10,000 shares without nominal par value, but not to exceed $500,000.

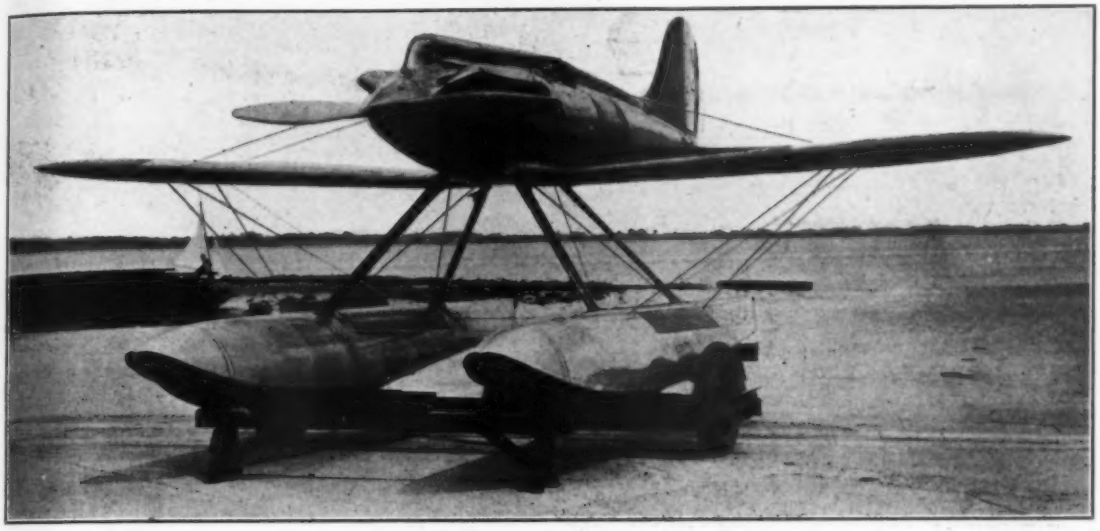
Canadian Air Lines

An announcement that a regular air service to Turner Valley would be commenced in the immediate future by the Rutledge Air Services, Ltd., has been made. The exact date of the commencement of service will be published immediately. Under the scheme, the first regular service of 'planes between Calgary and Turner Valley leaving at stipulated times, will be established, and it was announced that special emphasis will be paid on promptness of departure.

Portsmouth's Aerodrome Plans

A deputation recently interviewed Government officials concerned in connection with a scheme for establishing a municipal aerodrome at Portsmouth as part of the plans for dealing with unemployment. The Lord Mayor of Portsmouth flew over the city in company with Sir Alan Cobham on Tuesday. The flight was made from Cowes because the alighting place in Portsmouth chosen by Sir Alan Cobham was regarded as prohibited area by the Service authorities.

THE BRITISH SCHNEIDER TROPHY DEFENDERS



THE GLOSTER-NAPIER VI : This three-quarter front view emphasises the beautiful lines of the machine.
("FLIGHT" *Photo.*)

ITS arrival impatiently awaited by service and press alike, the Gloster VI racer, with Napier VII D racing engine, was brought from Cheltenham to Calshot on Saturday of last week, and erected without loss of time. Representatives of the press were permitted to see the machine on Sunday, and to say that they were impressed is to put it mildly. When the hangar doors were opened and the machine wheeled out it was seen that the Gloster-Napier VI is a very diminutive monoplane, streamlined with the most extreme care, and finished in a peculiar matt-brass colour which, although admittedly not making the machine fly any faster, certainly increases the impression of "daintiness," which perhaps best characterises this year's Gloster Schneider defender. Actual dimensions may not be given, but the Gloster-Napier VI *appears*, as regards its fuselage, even smaller than the 1927 Supermarine S.5. Just how far this is actually the case, or whether it is due to the effect of lines and colouring, is difficult to say. But that an engine of the power of the Napier VII D, and a pilot of average size, could be got into a smaller compass is difficult to imagine. It is also worth noting that for this year's contest Mr. Folland has adopted the monoplane arrangement.

No figures may be published concerning the power developed by this year's Napier racing engine, but it is probably no secret that its power is considerably greater than the power of the 1927 Napier racing engines. On the other hand, the power is certainly not as great as that of the Rolls-Royce "R" engines fitted in the Supermarine S.6 monoplanes. Thus the Schneider contest will have added interest from the fact that the two British types of machine produced for this year's contest differ quite a good deal, in spite of their generally similar appearance. Both are low-wing monoplanes, with streamline wire bracing. But the S.6 has a more powerful and heavier engine, which at once means a slightly larger machine to carry the extra weight of engine and the weight of the extra fuel which the more powerful engine will consume in covering the Schneider course. There probably is a definite limit in power for a single-engined type beyond which it does not pay to go, because the machine size, after a certain point, increases in proportion. Whether the Supermarine-Rolls-Royce S.6 or the Gloster-Napier VI provides the best combination of power and size remains to be seen. It is quite possible that flight tests will indicate that there is very little to choose between them in the matter of speed.

In the design of the two types of machine the Gloster-Napier VI differs from the Supermarine-Rolls-Royce S.6 in two main respects, apart from the matter of size : The wings are attached to roots on the fuselage placed some distance out on the oval section, whereas in the S.6 the attachment is almost on the bottom centre-line. Consequently the float struts on the Gloster machine do not "meet at a point" as in the S.6, but enter the fuselage at points some 2 ft. apart. This may appear a very minor point in design, but it should be realised that in designing a racing machine to do, perhaps, something like 350 m.p.h., the "interference drag" is likely to be a serious consideration, and the problem of how to reduce it is a very important one. The Gloster monoplane wing differs from that of the Supermarine S.6 in that in plan form the maximum chord occurs not at the root but a considerable distance outboard, at the point where the bracing wires are attached. The maximum wing thickness occurs at the same point, the aerofoil section tapering in thickness from there to root and tip. Other differences in the aerodynamic design of the two machines are connected chiefly with the fuselage streamlining, the "broad arrow" arrangement of the Napier engine requiring a type of cowling rather different from that of the Vee type Rolls-Royce engine.

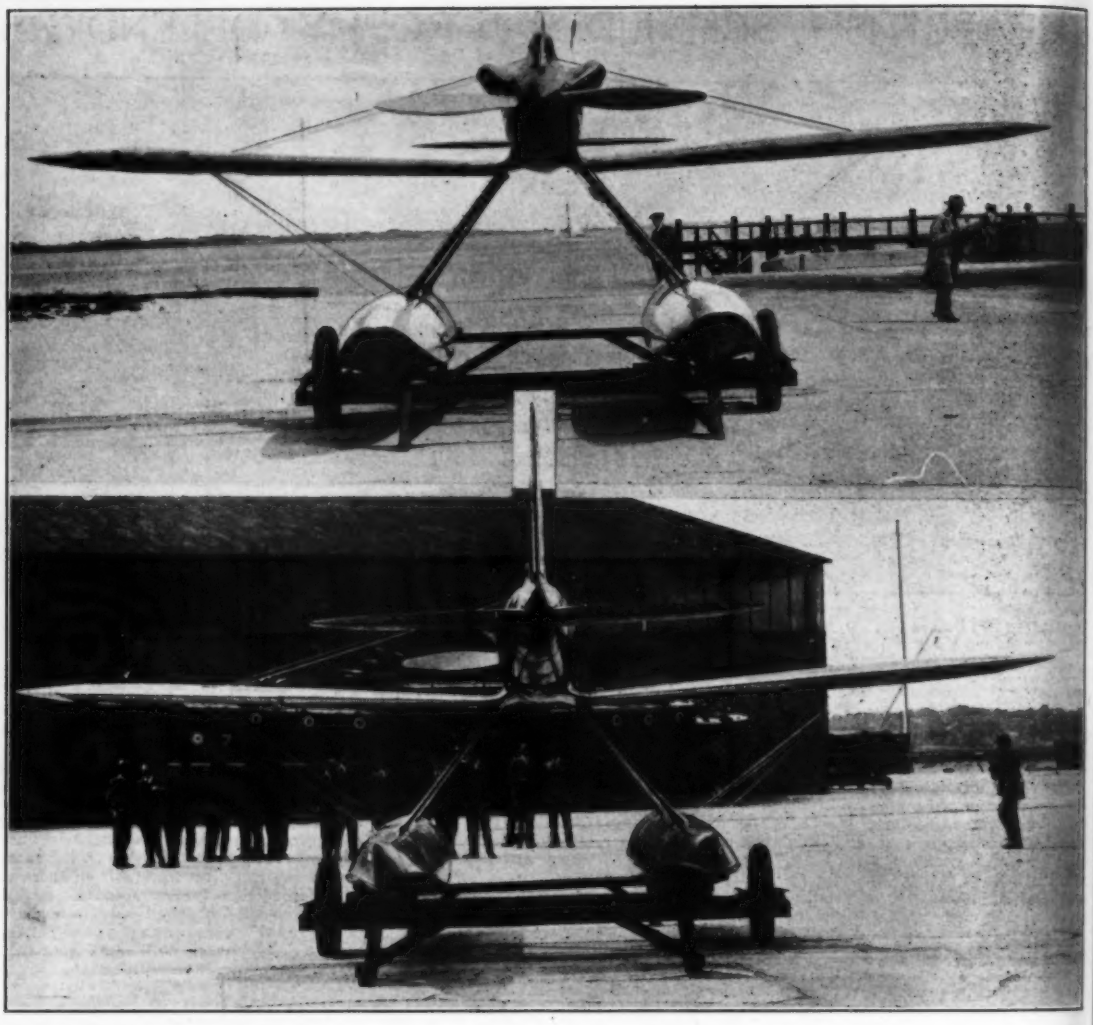
Constructional Features

In the matter of construction, Mr. Folland has used, in the Gloster-Napier VI, a "mixed" form, the fuselage and floats being built of duralumin, while the wings are of wood. The fuselage is of the *monocoque* type, with light formers of duralumin, and a skin or plating of duralumin sheet. All rivet heads are sunk in flush with the skin so as to reduce friction drag by leaving a quite smooth surface. The thickness of the skin is graded from nose to stern. In cross-section the fuselage is the smallest that will contain the engine and pilot, and the planning of the lay-out of controls, piping, &c., to come within such a small compass must have presented a pretty problem.

The monoplane wings, as already mentioned, are of all-wood construction, with multiple spars (6) and a planking of spruce, laid on in two plies, one diagonally. This planking is made up on a former of the same contour and curvature as the actual wing, and when the waterproof glue is dry, the planking is removed and transferred to the wing, and there secured to the spars and leading and trailing edges with screws. All the main lift wire fittings are of high-tensile steel, and completely housed inside the wings, only the streamline wire protruding.

The duralumin floats are of usual Gloster design and construction, with straight top and vee bottom, a single step and a vertical stern post. Each float has a single, deep, fore and aft member or keelson, and a number of transverse frames spaced some 18 in. apart. The float bottom is reinforced with "Z"-section stiffeners, and the deck with L-section stringers. In the floats, as in the fuselage, flush-head riveting is employed to give a smooth surface. Three watertight bulkheads are employed in each float so as to reduce the risk of sinking in case of damage to one compartment.

In constructional detail principle the tail of the Gloster-



THE GLOSTER-NAPIER VI : The extremely small cross-sectional area is well brought out in these front and rear views. ("FLIGHT" *Photos.*)

Napier VI is similar to the wing, being of all-wood construction. The covering is, however, in the form of multi-ply wood. The angle of incidence of the tail plane can be adjusted from the ground, but not in flight.

In connection with the controls, it is almost superfluous to state that there are no external levers or cranks, all being housed inside either the wing or fuselage. A form of variable gearing has been incorporated in all the controls in such a manner that the control surfaces are "geared down" in relation to stick and foot bar for small initial movements, and "geared up" for larger movements. The object of this variable gearing is, of course, to make the controls light and effective both at high and low speeds. It may be stated that for the initial movement the gear ratio is approximately as 3 to 2, while for the last few degrees of possible movement the ratio has changed roughly to 2 to 3.

Cooling Systems

Ever one of the most difficult problems in the design of a racing machine, the water and oil cooling systems in the Gloster-Napier VI show some unusual features. Unfortunately, it is not permissible to go into any great detail, beyond stating that as in all racing seaplanes of recent years the water radiators are of the wing-surface type, consisting of flattened tubes laid side by side and sweated together, the tubes running in a fore and aft direction, and being joined at their ends, *i.e.*, at leading and trailing edges, by collectors running at right angles to them. As the total wing area of the machine is so small, nearly the whole of it is covered with radiators. The exception is a narrow belt in the region of the bracing wire attachments, and the extreme wing tips.

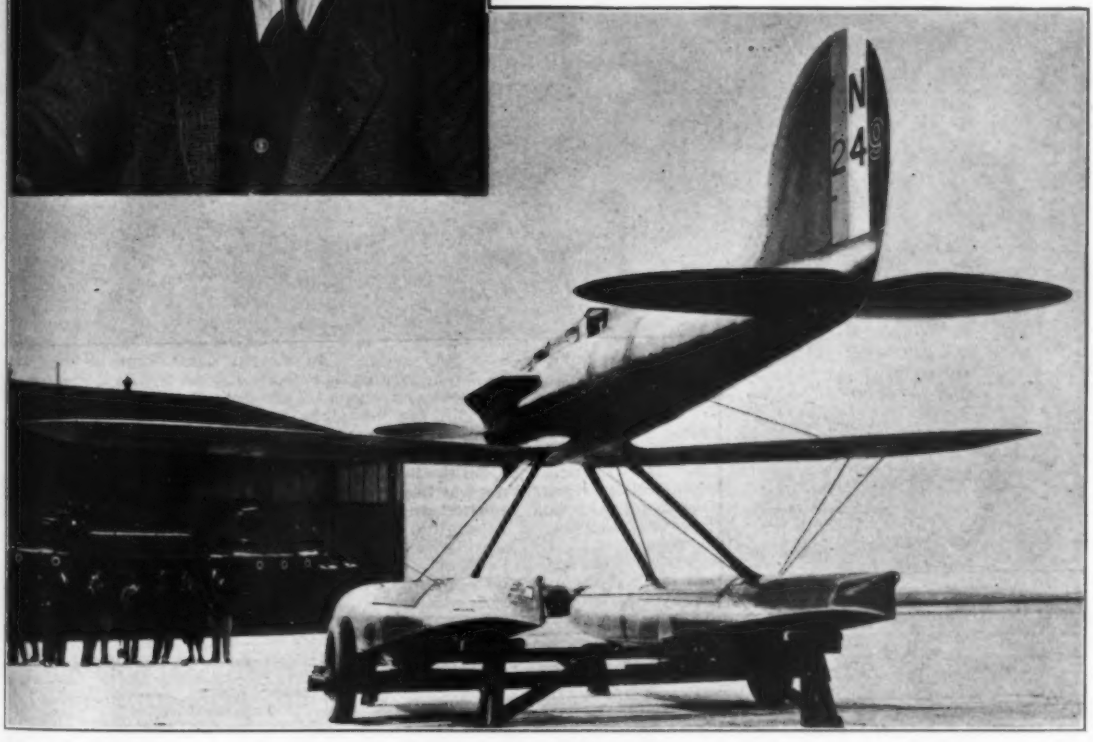
The oil cooling system is somewhat similar in principle, but the radiator portion is formed by a ring of flat tubes surrounding the fuselage just abaft of the cockpit, and the oil tank is carried just behind the pilot. The surface of the oil cooler is let in flush with the fuselage covering, and follows the contour thereof. Additional oil cooler area is provided on the decks of the two floats.

Petrol System

In previous Gloster racing seaplanes the fuel has been carried in the fuselage. The reduction in cross-sectional area which has taken place in this year's machine has made this arrangement impracticable, and the system of carrying the fuel in the floats has been adopted instead, the fuel being equally divided between the two floats, and a service tank of small capacity (about 2 gallons) being placed in the fuselage. Two fuel pumps transfer the petrol from the float tanks to the service tank, and a special arrangement ensures that the amount of petrol taken from each float tank shall be the same.

The propeller used in the Gloster-Napier VI is of "Gloster" design and construction, and is made from a solid forging, milled on a special machine to ensure correct contour and pitch of the blades. No twisting of the blade is necessary.

For obvious reasons, no speed figures can be given, but it is claimed for the Gloster-Napier VI that, although a pure



THE MAN AND THE MACHINE : Above, Mr. H. P. Folland, Chief Engineer and Designer of the Gloster Aircraft Co., and the very pretty monoplane produced for this year's Schneider Trophy Contest. (" FLIGHT " *Photos.*)

speed machine designed to operate at sea level, it has an initial rate of climb of nearly " a mile a minute." Converted into more customary climb figures, this represents a sea level rate of climb of approximately 5,200 ft. min., which is probably more than twice the rate of climb obtained by any other type of aircraft !

The Napier " Lion," Type VII D

The engine produced by the Napier firm for two of this year's Schneider Contest machines is a development of the 1925 700-h.p., and 1927 900-h.p. models. The new engine develops a great deal more power than did the 1927 type. How much more may not be stated, nor the manner in which the extra power has been obtained. It is, however, permissible to mention that a supercharger has been incorporated, so mounted on the rear end of the engine as not to increase the frontal area, nor to cause protuberances of any kind

One of our photographs shows the new engine, and the small size and generally " clean " appearance are noticeable. Actually the frontal area has been slightly reduced in spite of the extra power, and this fact has helped materially in enabling Mr. Folland to design such a tiny and clean machine around the " Lion " VII D. It should also be mentioned that the air compressor has been designed by the Napier firm, with the cordial co-operation of the British Thomson-Houston Co., Ltd., of Rugby, and the Bristol Aeroplane Co., Ltd., of Filton, Bristol.

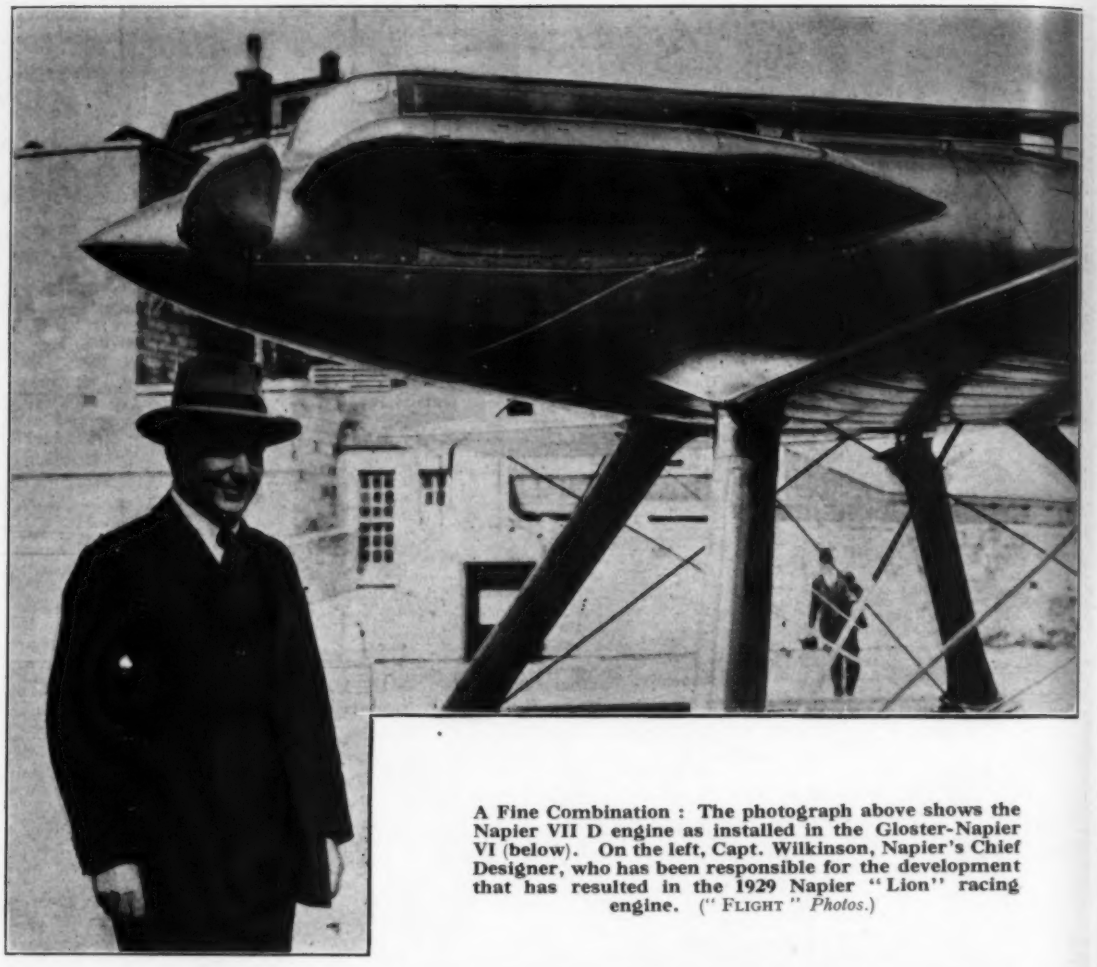
The latest type of " Lion " is a triumph of engine design, while retaining the " broad arrow " formation of its cylinder arrangement, and Capt. G. S. Wilkinson, F.R.Ae.S., M.I. Mech.I., M.I.A.E., deserves every credit for the manner in which he has developed these racing engines from the original " Lion."

SCHNEIDER TROPHY TRAINING

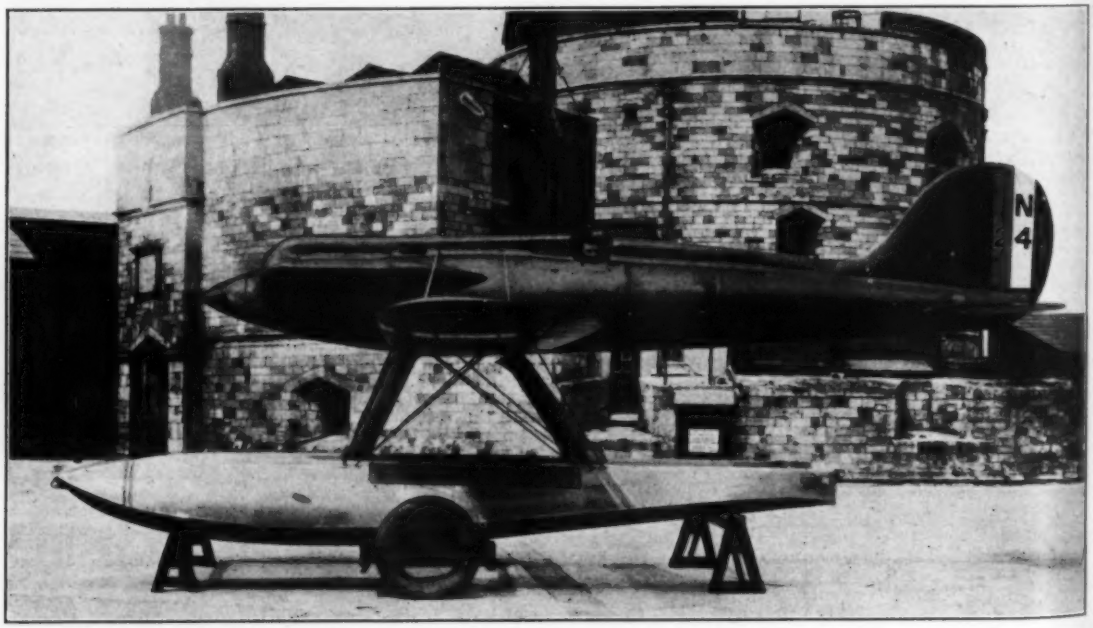
By MAJ. F. A. de V. ROBERTSON, V.D.

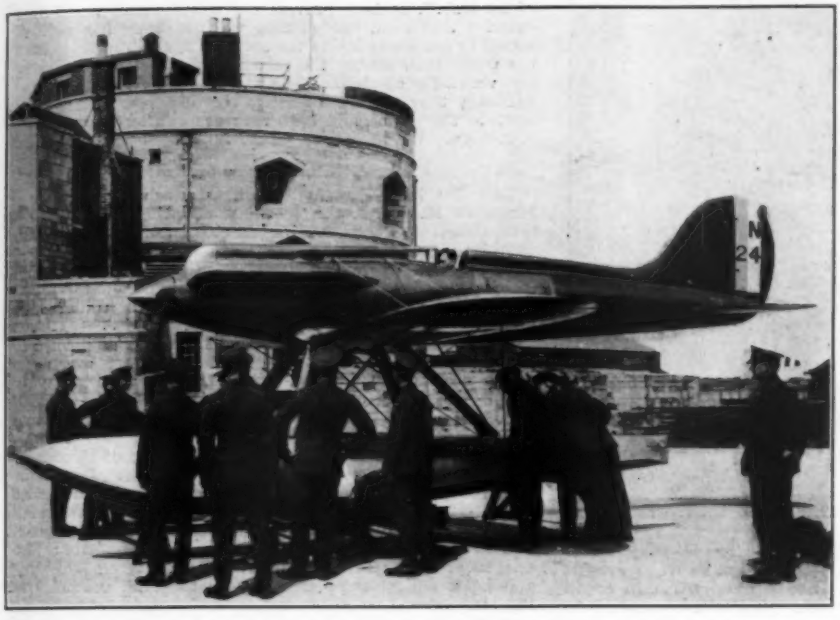
Calshot, Friday, August 16.—To-day saw the High-Speed Flight in the unusual position of having no high-speed machines to fly. The Supermarine Rolls-Royce S.6 has gone back to Woolston to have the dent removed from one of the floats. It was a very small dent and was only noticed more or less by chance, still it is as well to have it straightened out. The two Venice machines which were on view at Olympia, one S.5 and one Gloster 4, have not yet been put into service again. The remaining two Gloster biplanes and the Venice winner are all undergoing their periodical overhauls. The much-desired Gloster-Napier 6 has not yet arrived. It left Cheltenham this morning by road and is due at Calshot some time tonight, probably during the small hours of the morning. If it duly arrives, it should be erected tomorrow, and may be flown on Sunday.

This left the Flight with only Flycatchers (Jaguar) and an



A Fine Combination : The photograph above shows the Napier VII D engine as installed in the Gloster-Napier VI (below). On the left, Capt. Wilkinson, Napier's Chief Designer, who has been responsible for the development that has resulted in the 1929 Napier "Lion" racing engine. (" FLIGHT " *Photos.*)





Daintiness personified: This side view of the Gloster - Napier VI gives, by the "scale" supplied by the R.A.F. personnel standing around, a good idea of the smallness of the machine. ("FLIGHT" *Photo.*)

Avro Avocet (Lynx). These were kept quite busy. Early this morning, Flight-Lieut. D'Arcy Greig in the Avocet, and Flying Officers Atcherley and Waghorn in Flycatchers, did some very pretty formation flying. It has for a long time past been an ambition, I believe, of D'Arcy Greig to fly the three Gloster biplanes in formation at, perhaps, 250 m.p.h. If and when it comes off it should be a very effective sight. After the formation was finished, Atcherley put a Gloster through every conceivable stunt. His slow rolls just over the station were most effective. When the machine is flying straight it looks as if nothing would induce those substantial floats to go up and over sideways. But Atcherley turned them up, to all appearances, as easily as if he were rolling off a log.

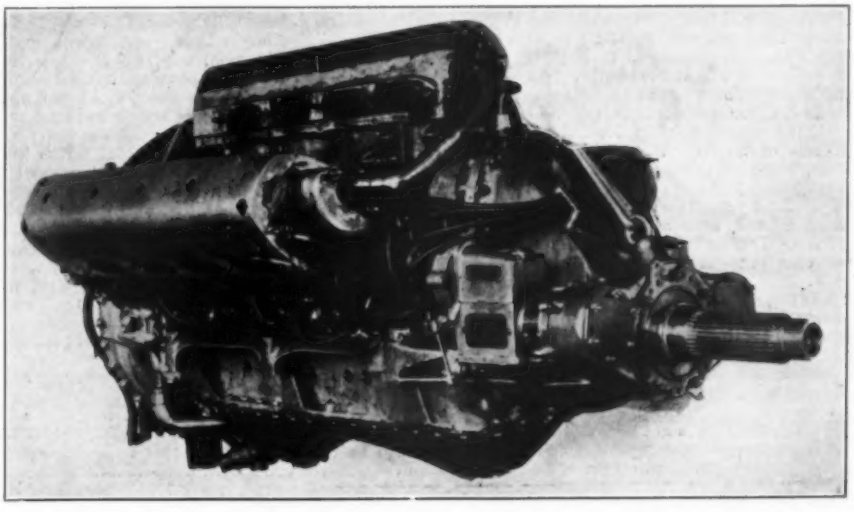
When Atcherley landed and taxied up to the slipway, Flight-Lieut. Stainforth was waiting for him. Atcherley descended from the cockpit on to the waiting shoulders of a wading aircraftsman, and before he was ashore Stainforth had taken his place in the cockpit. The aircraftsmen turned the machine round, and away went Stainforth, the slip stream casting up the spray and gently spattering your correspondent with brine.

Three times this morning we were enlivened by the sight of the Saunders-Roe "Cutty Sark" flying over Calshot, doing some of her trials. She made a very pretty sight with her effective colour scheme of blue and white. A monoplane flying-boat is one of the prettiest aircraft one can see in the air, especially when she is right overhead and one cannot see her engines at all. She seemed to handle very nicely in the air. There were at least three people in the cabin—perhaps four, but I could not see that. Sir Alliott Roe himself came over to Calshot in the morning.

We had, in fact, various visitors today. Sir Philip Sassoon, late Under-Secretary for Air and now chairman of the Royal Aero Club, came across from the Hamble river by motor boat, looked round the station, and had lunch in the officers' mess. Another arrival was the cook engaged to look after the inner men of the Italian team. He had been engaged in London, but he does not seem to be very fluent in English.

A message from Rome, published today, states that the Italian team which is coming over, exclusive of the cook, is to consist of Lieut.-Col. Bernasconi, in command, Capts. Motte and Canaveri, Lieuts. Monti and Cadringher, and the warrant officer pilots Dal Moulin and Agello. I have heard

The Napier "Lion" VII D: Of even smaller overall size than the 1927 model, this year's Napier racing engine is supercharged, and gives considerably more power than previous types.



AN "EARLY PRESS VIEW": These journalists could not wait until the Gloster-Napier VI was brought out of its hangar, but obtained a peep through some bolt holes in the hangar wall. (We offer no prize to readers recognising the two press representatives.—Ed.) ("FLIGHT *Photo.*")

that Dal Moulin, whose rank is Marinerallo (presumably meaning Sergeant Major of Marines), is certain to be one of the actual pilots in the race, but we shall learn all those facts in due course.

Today saw a break in the period of fine weather which has been so very useful to the training of the H.S. Flight. The morning was calm and only slightly misty, but in the afternoon a really heavy storm of rain passed over, and parts of the station, where the concrete is a bit uneven, were almost ankle deep in water for about half an hour. If bad weather had to come, it was kind of it to come when no H.S. seaplanes were serviceable. We all hope it will clear by the time the Gloster Napier is ready to take the air.

Wing-Commander B. L. Huskisson has also come to Calshot. He is in charge of the R.A.F. surface craft during the period of the race. A few of these have already arrived at Calshot, but he is robbing all the coastal stations, and will presently mobilise a fleet of about 40 craft of different ratings. Among them will be two pinnaces, each capable of holding about 40 people and doing 11 knots. These will be used for conveying distinguished Italian and American visitors about during the race period. Then there will be some Brook 35 ft. motor boats, which do 15 knots. There will be Kelvin boats to tow the special pontoon on which the British racing seaplanes will be conveyed from the base to wherever they are to take off. The Italians moved their Macchis about on pontoons at Venice. There the reason was, so we understand, to keep the wooden floats out of the water as long as possible. Our floats are metal, but when our machines taxi about much with the engine running slow, the plugs are apt to get a deposit of lead on the points. Now, when the water is calm, we do not ask our seaplanes of 1927 to taxi far out before taking off. The pilots start them off straight from the slipway. Last year they were always towed out, and then there was the job of starting the engine from the boat.

Wing-Commander Huskisson is having about six Brook sea cars brought here by road. These carry six persons each. His fastest craft will be coastal motor boats and Thornycroft high-speed boats, all capable of 45 knots. One of these will be stationed by each pylon during the race, and will be equipped for first aid. There will be on board a doctor, a hospital orderly, a stretcher, first-aid outfit, and a 30-gallon fire extinguisher. The observers at each pylon have to send out a wireless signal as each machine rounds their point. So many seconds are allowed for it to reach the next, and if it is not sighted in that time, the motor boat will dash out to investigate. Their function will not be to try to salvage a crashed seaplane, but only to help the pilot.

The Royal Navy will be responsible for policing the water inside the quadrilateral area of the course. It will be the task of the R.A.F. boats to prevent any unauthorised vessel from entering that area, though they will also have free right of access to anywhere inside the area. They will have to keep the water clear during the preliminary trials on the Friday and watch the seaplanes while they are moored out. On the Saturday they will have to take the observers to the stage boats at the pylons, and bring them ashore afterwards. Altogether, they will have a very busy time.

The Gloster-Napier 6 Arrives

Saturday, 17th.—The first Gloster-Napier arrived on three lorries at 10.30 a.m. this morning, and was at once taken into a shed for erection. The mechanics from Cheltenham were busy on the work all day, and an aircraftsman stood sentry at the door to prevent unauthorised persons from intruding and watching the mysteries of the Gloster toilet. It is hoped to have things ready for an engine run-up soon after mid-day tomorrow.

In the afternoon the Supermarine Rolls-Royce returned to Calshot on a pontoon.

The rain had cleared off today, but the wind was very fresh. Even Southampton Water was heavily flecked with white horses, and flying was out of the question for anything except Southamptons. Most of the flying-boats of this station are away now at Leuchars, I believe, but there have been some metal Southamptons here on visits. One came here today for a short spell, carrying an important senior officer who was accompanied by a certain Aircraftsman Shaw, who is believed once to have borne another name, and to be rather a dab at the Arabic language. He is also said to be rather keen on speed, and he was probably disappointed not to have seen any of the H.S. machines in the air.

In the afternoon the Schneider Cup Committee came down to Calshot. On the way they had a meeting with the Chief Constable of Hampshire and agreed with him on arrangements for assisting the road traffic which is sure to come down to see the race. It was agreed that cars making for Portsmouth shall display a prominent red disc, those for Gosport and Stokes Bay a yellow disc, those for Lee-on-Solent green, and those for Hayling a disc of Cambridge blue. All motorists are asked to procure the right badge in their own interests. The firms which book seats and the R.A.C., etc., will be asked to supply these badges.

Regulations for the Navigability Tests

The Committee announced the following regulations for the tests on Friday, September 6. The area chosen for the tests is as near as possible to Calshot. It is bounded by lines drawn from Cowes to Stone Point in the New Forest, to the Agwi oil tanks, to Hamble and along the coast to Lee-on-Solent, to Kingsquay in the Isle of Wight, and thence to Cowes.

Somewhere near the Calshot lightship there will be an imaginary circle with a radius of a quarter of a sea mile. Whatever the direction of the wind on the day, one diameter of this circle will provide the necessary half sea mile which must be taxied over twice. It will, of course, be marked appropriately by buoys. There will also be a starting line and finishing line laid out according to the direction of the wind. Each machine may be taken out into the area as is thought best. The British machines will be towed out on their pontoons . (N.B.—American readers should note that the word pontoon is used in the English and not in the American sense. It is not the equivalent of a seaplane float, but means a sort of boat on which the complete machine will be raised out of the water for transport.)

Machines must taxi across the starting line and then rise and continue over a course of 10 sea miles, during which each machine must alight twice and taxi over the measured half sea mile at a minimum speed of 12 knots. It must alight again and taxi over the finishing line.

Having completed the navigability test, which will involve flying some 40 to 50 miles, the machines must proceed straight to the mooring area, which is the bay just to the north of Calshot station. This progress must be made on the water, but machines may either taxi there or be towed. They will then be moored out for six hours as a water-tightness test.

During these two tests no repairs will be allowed, and a seaplane must not undergo any modification between these tests and the speed test. It will be stamped to ensure this. Changing the propeller, cylinders, sparking plugs, magnetos, ignition or other leads, navigating instruments, etc., is not considered a modification of the aircraft.

The navigability tests will commence at 7 a.m. on the Friday. There is at that hour the best chance of calm water.

Starting the Race

The zero hour for the start on the Saturday will be 2 p.m. The starting ship will be a monitor, H.M.S. *Medea*, which will be moored probably in the neighbourhood of Calshot. It will signal to each machine, giving permission to take off, by a gun and by hoisting the national flag at the mast-head.

On receipt of the signal each pilot is allowed 10 minutes in which to rise and cross the starting line at Ryde pier in flight. If he crosses the line before the expiry of the 10 minutes he will be timed from his actual crossing of the line. If he takes more than the 10 minutes he will be timed as if he had actually crossed at the end of the 10 minutes. Thus, if one pilot takes 11 minutes from the firing of the gun until he crosses the line, 1 minute will be added to his actual flying time.

There will be an interval of 20 minutes between each starting gun. There should normally be only two machines in the air at once, and never more than three. If seven machines start, as seems probable, the last will get off at 4.10 p.m. and the race will be over before 5 p.m.

The Committee wish to emphasise the distinction between *delaying* the start from minute to minute, and *postponing* the race from day to day. At 1 p.m. on the Saturday red flags will be hoisted at all stations round the course, and so long as they remain flying the race has not been postponed till the next day, though the start may have been delayed in the hope of better weather. Spectators, wherever they may be, should note this. Rumours are apt to get about when the start is delayed that the race has been postponed, and cars may endeavour to get off home. So long as the red flag is flying all such rumours should be disregarded. The Committee will not postpone the start till the next day, until all hope has been abandoned of completing the race on the proper day.

Once a postponement has been decided upon the red flags will be hauled down and blue ones will be hoisted in their place.

A Good Flight by Orlebar

Sunday, August 18.—At 6 p.m. the sea had subsided, though there were rain clouds on various points of the horizon. However, Sqdn.-Ldr. Orlebar had the Rolls-Royce engine run up, and after it had been pronounced O.K. the S.6 was launched and towed out towards Lee-on-Solent. The Bristol starter in the launch soon had the engine going again, and Orlebar then headed into wind and took off. There was a certain amount of wind to help him as compared with last Monday, when he took a run of 31 seconds. He climbed slowly and did gentle left-hand turns with very moderate banks. He seemed to be gradually getting the feel of the machine. After circling twice between Calshot and Cowes, he then did a couple of right-hand turns out near the Isle of Wight. The race will be flown anti-clockwise, so the left-hand turn is more important to practise, and he returned to it. Sometimes he disappeared in the evening mist in the direction of Ryde. Each time that he reappeared and came over Calshot he had somewhat increased his speed and was banking more sharply. Evidently he was getting accustomed to the S.6 and was liking it. At last he came over the station quite fast and confidently threw the machine into a vertical bank All went well, and the next time round he repeated this manœuvre even more smartly and sharply. The machine went over steadily and cleanly, and the wings gripped the air like the wheels of a car banking at Brooklands. Then we saw a few bursts of real speed, but it was, of course, impossible to judge the pace. After 27 minutes the pilot alighted and was towed in. He has now flown the S.6 four times and has totalled about an hour and a half in the air with it.

As I was driving back to my hotel with a friend about 8 p.m., we saw a coupé Moth in a field by the road, and a tall figure in a white flying suit with the stripe of a flying officer on the shoulder strap was talking to a small crowd of villagers. It proved to be F/O. Nigel Norman, of No. 601 County of London Bomber Squadron, who had flown over from Lympne to dine at the Calshot mess. That is how the light aeroplane is now used by a few, and will soon be used by the many.

Waghorn Tries his Hand

Monday, August 19.—Sqdn.-Ldr. Orlebar evidently feels that he himself is now all right on the S.6 and that it is time to put the other pilots through their paces in that machine. I do not know if they tossed up for who should go next, but anyway F/O. Waghorn was selected. He went out at 6.30 this morning and first taxi-ed the machine about to get used to the controls on the water. He then made a good take-off and flew for 34 minutes, his flight including vertical banks as well as straight flying. His landing was also good. It was a calm morning with sea almost glassy, and some low clouds.

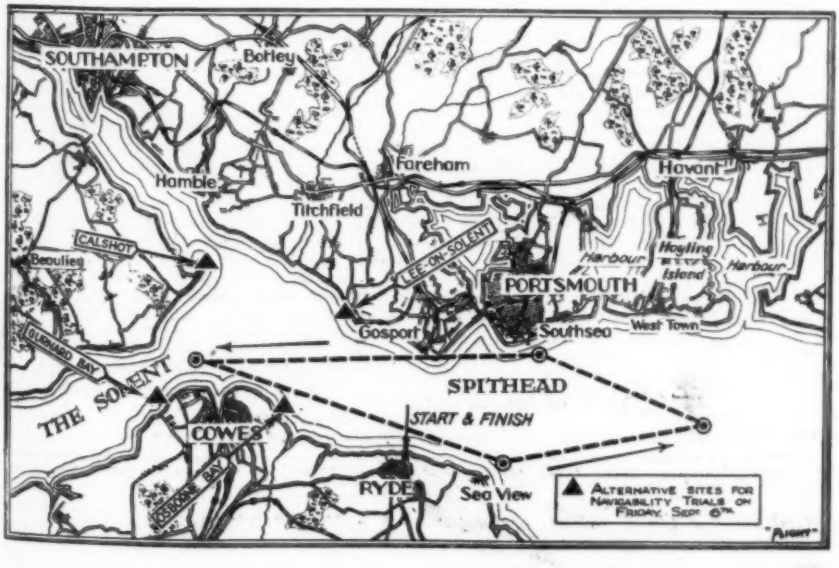
Before Waghorn alighted, F/O. Atcherley went up in one of the Gloster biplanes which has now come back on to the serviceable list.

Later in the morning there was a practice drill in moving a Gloster biplane on to a pontoon and off again. After this was over Orlebar climbed into the Gloster and went round the course, while D'Arcy Greig practised in a Flycatcher. The weather by that time had become quite bright.

In the afternoon there was some delay in getting things under way. At 3.30 Flight-Lieut. Stainforth went up in a Flycatcher.

Tuesday, August 20.—Flying Officer Atcherley had his first test on the S.6. For 15 minutes he practised taxying, then took off after a long run and handled the machine well. He may a perfect landing.

August 21.—Gloster-Napier is to fly with pilot totally enclosed in coupe. Atcherley flew the S.6 again this morning and made the best take off yet seen, but he landed after six minutes.



Course of the Schneider Trophy Contest: The four turning points will be off West Cowes, Sea View, Southsea and Hayling Island. Originally it was intended to hold the navigability trials at one of the four locations indicated by black triangles, but it has now been announced that these trials will be held within an area bounded by the following lines: Cowes, Stone Point, Agwi oil tanks, Hamble, Lee-on-Solent, Kingsquay, Cowes.

HOW AND WHERE TO VIEW THE SCHNEIDER TROPHY CONTEST

NEARLY a million people are expected to witness the great international seaplane race for the Schneider Trophy which takes place off the Isle of Wight on September 7.

Italy and America have each entered teams to challenge the British defenders, and record speeds are expected to be reached in the contest, which will be fought out over a quadrilateral course above the Solent between the Isle of Wight and the mainland.

Elaborate arrangements have been made to accommodate the vast crowds of visitors who are arriving by air, land and sea. Two land aerodromes at Hamble and East Cowes and one seaplane station at Cowes have been reserved for visiting aircraft under the supervision of the Automobile Association; spectators afloat will be berthed, according to the size and draught of their vessels, in the special zones which have been reserved inside the boundaries of the course (details of which have already been issued). For those visitors arriving by road or rail extensive arrangements have also been made by motor-coach companies, the various motoring organisations and the Southern Railway, who, alone, are running a series of special trains to Southampton and Portsmouth, at 15-minute intervals, throughout Friday evening and Saturday, the day of the race.

Points of Vantage

The Royal Aero Club recommends those desirous of witnessing the contest to make advance arrangements now and for the guidance of intending spectators, issued preliminary details of the facilities available at the principal vantage points around the course, as follows :—

The club itself has chosen as its official ships, two vessels of the Orient Line. One of them the "Orford," will be reserved entirely for members of the club, but the other, the "Orontes," will have some accommodation available for the general public. The P. & O. liner "Ranchi," which sails on September 7 for a 28-day cruise in the Mediterranean, will anchor in the Solent until the race is over. The R.M.S.P. "Araguay" is offering a view of the race from the Solent, followed by a week-end cruise down the Channel as far as Torquay, returning to Southampton by 8 a.m. on the following Monday.

Motorists who wish to see the race from their cars may book places in advance in the official car-parks at Gosport, which are situated on the mainland opposite the starting and finishing point, and on the only ground over which the seaplanes will pass. Detailed instructions for such motorists are issued by Messrs. Woolfe and Lucas, Denman Street, W.1, to whom the Royal Aero Club has entrusted the management of the official car-parks.

PORTSMOUTH AND SOUTHSEA.—Many thousands of people are expected to assemble on the 4½ miles of front. Excellent views of a turning point can be had from the South Parade Pier, which will accommodate 5,000 people, while a further 3,000 seats will be available on the Parade in front of the Castle.

Stands holding many thousands will be erected at intervals along the front and, from the natural grandstand of the foreshore, the race will be visible practically throughout its course. In addition, the whole of Southsea Common is to be turned into a car park.

STOKES BAY.—This area, ranging from Gosport round Gilkicker Point to Fort Haslar is the only land over which the competing aircraft will pass, and provision has been made for a widespread concentration on this point by spectators. A large car park will be situated on the Common, and the area should be approached via Fareham main road, which will be plainly sign-posted.

HAYLING ISLAND.—Official car parks will be provided, and the long foreshore permits of the accommodation of many visitors.

LEE-ON-SOLENT.—Car parks and public enclosures along the sea front.

RYDE (I.O.W.).—The scene of the start and finish of the race. One portion of the pier, belonging to the Southern Railway, will be reserved for special, inclusive excursions run from London on the day of the race. The tickets are issued at the inclusive cost of £3 3*s.* each, and include rail and boat journey from and to London (Victoria) and Ryde Pier Head, together with a reserved seat on the pier, from which an excellent view of the contest will be afforded. Tickets are limited to the seating capacity on Ryde Pier, and must be purchased in advance. The other portion of the pier, owned by Ryde Council, will be open to the public. In addition, special enclosures will be available along the front with numerous car parks.

Steamer trips to Spithead, at a guinea a head, will be run from Ryde Pier Head, Portsmouth Harbour, Clarence Pier, and South Parade Pier. Passengers on these steamers will be taken to an anchorage in Spithead, and will have a splendid view. In order to provide the maximum comfort for intending passengers, tickets will be limited to half the normal carrying capacity of the boats employed, and should be purchased in advance at Ryde Esplanade, Portsmouth Harbour, Clarence Pier, and South Parade Pier. A limited number of tickets at 10*s.* 6*d.* each, will also be issued by the motor ferry from Portsmouth.

COWES AND EAST COWES (I.O.W.).—Opposite an acute turning point on the course, these towns offer ideal vantage points and will be official car parks.

ST. HELENS (I.O.W.).—Provision is being made for public enclosures in Puckpool Park.

Messrs. Thomas Cook and Son offer two alternative plans for seeing the race. Arrangement A, at an inclusive charge of £3, provides travel from Victoria, *via* Portsmouth, to Ryde, a reserved seat on Ryde Pierhead, and the return journey. Arrangement B, for which the charge is £3 3*s.*, comprises travel by special train from Waterloo (leaving at 8.18 a.m.) to Southampton, a view of the race from the s.s. "Balmoral" or s.s. "Lorna Doone," luncheon on board the steamer, and the return to London, reaching Waterloo at 9.56 p.m.

The Royal Aero Club adds that it is arranging for loud speakers and large score boards to be installed all round the course wherever public enclosures are provided, in order to keep visitors acquainted of the progress of the competing aircraft, lap by lap.

Despite the very high speeds likely to be attained on sea, no danger to spectators need be anticipated, as ample provision has been made for emergency landing lanes in case of accident to competing seaplanes, which will be able to alight well beyond the limits of the course, the public enclosures and ship berthing areas.

Sunday Flying

The Royal Aero Club, as the responsible authority for the organisation of the contest, announces that it has received protests from various bodies concerned with Sunday observance, against any proposal that the contest should be held on Sunday, September 8, in the event of inclement weather being experienced on the previous day.

The Royal Aero Club, while appreciating the principles underlying these protests, desires to impress upon the public and others the absolute necessity of good weather conditions to provide for the reasonable safety of the pilots, if, therefore, inclement weather is experienced on Saturday, September 7, the race, by international precedent, must be postponed from hour to hour or day to day, and should it so happen that suitable weather conditions obtain on Sunday, September 8, the contest will necessarily take place on that date.

In order, however, not to disturb the Sunday morning hours devoted to religious observance, the Royal Aero Club will arrange that in the event of the contest being held on Sunday, September 8, the start will not take place prior to 2 p.m. On the Saturday the race starts at 2 p.m.

GREAT BRITAIN'S COMPETITORS AND SOME NOTES ON CALSHOT

The American Entrant

AFTER a study of the reports of the performances of the British entries, Lieut. Alford J. J. Williams, United States Navy, has definitely decided to enter his seaplane "Mercury." It was to be sent over either in the *Leviathan*, sailing from New York on August 21, or in another liner sailing on August 24. Lieut. Williams will be accompanied by Mr. John Kean, Chief Engineer of the Naval Aircraft Factory at Philadelphia, who designed the "Mercury" and superintended its construction. Mr. Kean is reported to have said that the British had apparently added power to their seaplanes at the expense of increased head resistance. He claimed for the "Mercury" decreased head resistance, together with increased power. The Packard engine mounted in the "Mercury" was rated at 1,100 h.p., but had developed 1,350 h.p., and an alternate engine, intended for use in the race itself, had developed an additional 200 h.p.

(*Continued on page* 907)

THE SHORT THREE-ENGINED FLOAT MONOPLANE

Bristol Geared "Jupiter" Engines

THERE was a time when there was considerable controversy on the subject flying-boat or twin-float seaplane. Experience has tended to what amounts almost, in this country at any rate, to standardisation, the flying boat type being used for large craft and the twin-float arrangement for medium-sized and small craft. That there is still room for discussion, even in the larger sizes of marine aircraft, of the problem boat or floats may come rather as a surprise to many, who by having become accustomed to think of all large marine aircraft as boats and all smaller marine aircraft as float types, may have assumed that this division of types was more or less final.

Those in close touch with British aviation have known that Mr. Oswald Short, one of the pioneers of the British aircraft industry, has long held the view that, even in quite large sizes, the twin-float arrangement might still be found to be a serious rival of the flying boat type. The opportunity has now occurred for testing out in practice this idea, and the large Short three-engined twin-float monoplane illustrated this week is the interpretation of Mr. Short and his technical staff of the large twin-float machine.

Whatever the result of practical experience may later prove to be, the twin-float arrangement does have this advantage that, should it be desired to do so, the machine can readily be converted into a landplane. In fact, an undercarriage for this purpose was designed concurrently with the design of the machine as a seaplane, and the landplane is illustrated in one of our drawings. A flying boat type could be fitted with a beaching trolley, and could even be made amphibian, but its conversion into a pure landplane would be likely to be a somewhat makeshift affair.

One very great advantage of the Short design is that, for a long Imperial air route for instance, on which seaplanes have to be employed over certain stages, landplanes over others, the same type of machine can be employed, the only difference being in the undercarriage used. If, as there is no reason to doubt, the machine proves equally serviceable in either form, the use of one type of machine throughout a long route will have a number of considerable advantages in that maintenance crews familiar with the seaplane type will be equally familiar with the landplane. The number of different spares to be stocked will be reduced to a minimum, and finally it is to be presumed that the price will be reduced because the operational company would be able to order straight away for example 10 machines instead of possibly five of one type and five of another. So that altogether there is much to be said for the Short design. In this connection it is worth noting particularly that the machine was designed primarily as a seaplane. Usually a machine is designed as an aeroplane and then, when wanted for marine work, "put on floats." The distinction is not, perhaps, a very obvious one, but it is one that may be of no small importance. A further important point in favour of this adaptability to float or land undercarriage is that one machine in reserve will suffice where otherwise two would be required. A complete machine, one imagines, would be kept in readiness but without its undercarriage. In case of a mishap to a machine in service, the spare, machine would be fitted with the requisite undercarriage and sent at once to the route section where it was wanted.

An examination of the three-view general arrangement drawings and of the photographs of the scale model reveals a number of interesting points in the conception of the new Short machine. To begin with, it is a monoplane, a fact which is in itself unusual in this country where hitherto the biplane has been the familiar type. The choice of the monoplane wing arrangement has brought with it the placing of the wing engines close under the wing surface, in streamline *nacelles*. The manner in which a wide track for the floats (or wheels) is attained is also interesting and unusual. The fuselage is, in fact, supported from the floats or wheels on outriggers rather than by the usual arrangement of undercarriage struts, and the lateral stability should be extremely good as a result of the wide track.

In aerodynamic design the new Short monoplane is very "clean" and has the appearance of being efficient. We understand that wind tunnel tests on a model have shown this to be the case, and the estimated speed range is more than 2 to 1, while the climb is good.

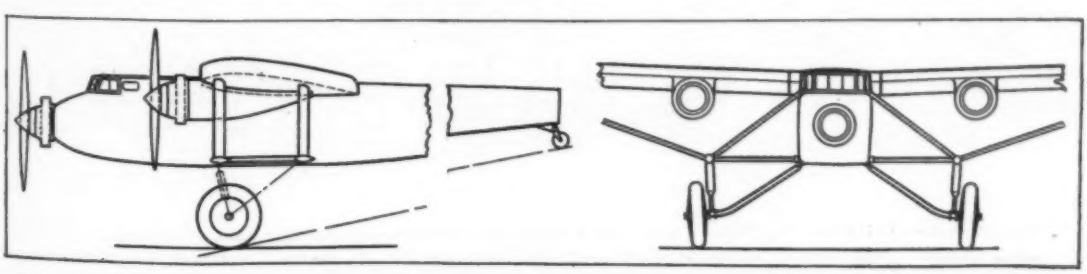
Structural Design.

That all-metal construction has been adopted was almost a foregone conclusion. The actual forms of construction employed are very similar in general principle to those familiar from Short flying boats, notably the "Calcutta." The external form of the fuselage is, of course, different from that of the "Calcutta" hull, but the main principle is the same, *i.e.*, L-section transverse formers or rings to which the skin plating is riveted in short panels, internal fore and aft stringers giving stiffness in compression, the stringers being interrupted at the transverse frames as in the Short flying boat hulls.

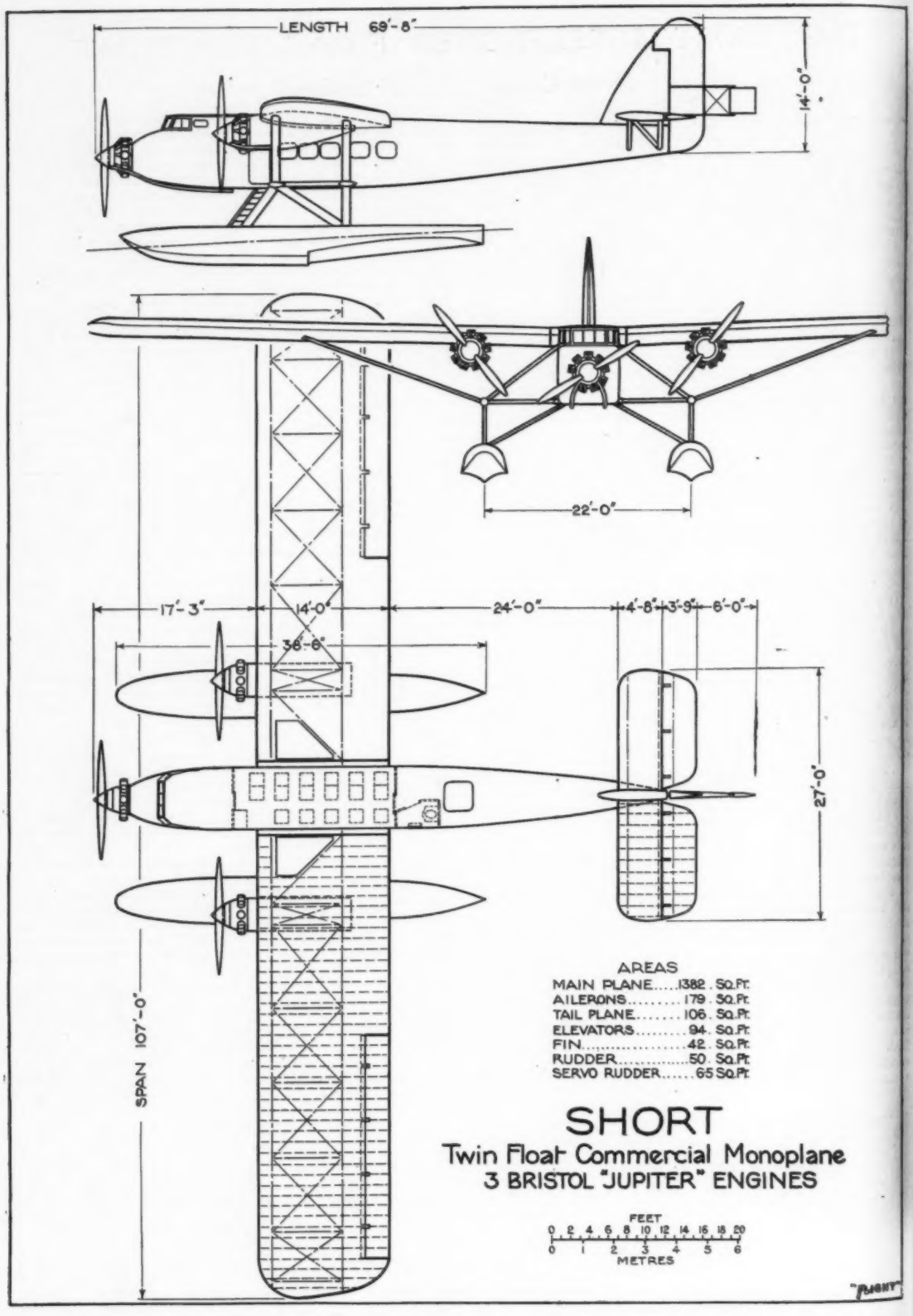
The wing construction also is similar to that of the "Calcutta," although the dimensions are, of course, quite different. A section of a monoplane spar was exhibited at the recent Olympia Show, and FLIGHT readers who saw it will recollect that it was a spar of impressive depth, somewhere in the neighbourhood of a foot. This form of spar has been employed with excellent results in the "Singapore" and "Calcutta" flying boats, and doubtless will give as good service in the new large monoplane. The gauge of Duralumin used in the monoplane spar is very thick, and the spar is made of uniform strength throughout by adding laminations in such places as are subject to particularly intense loads. Thus a very economical distribution of material is achieved, while the laminated construction has the further considerable advantage that should there be some slight undiscovered flaw in the metal, this will be confined to one lamination and will scarcely affect the strength of the complete spar.

The ribs also are similar in construction to those used in the "Singapore" and "Calcutta" machines, and consist of Duralumin tube booms and braces joined by light-gauge Duralumin pressings. For highly-stressed fittings extensive use is made of stainless steel, and such steel fittings as are not of this type are protected by zinc or cadmium coatings. All Duralumin employed in the machine has been anodically treated.

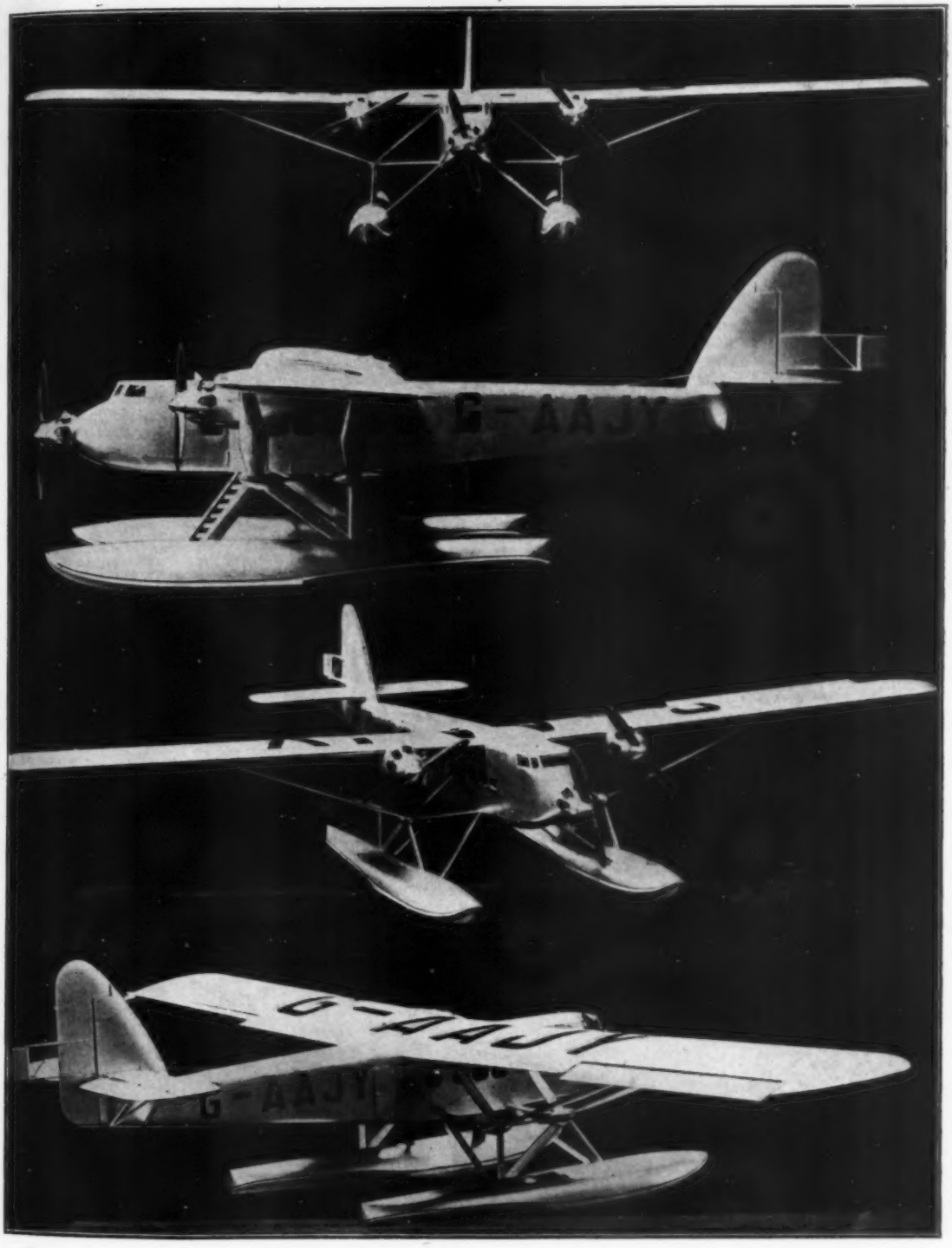
The floats are of usual Short type, constructed entirely of Duralumin. As a result of extensive research work in the firm's experimental tank, floats of a very high efficiency have been evolved, giving clean running, no tendency to porpoise, and of low water resistance. Bulkheads are fitted at short intervals, forming a number of watertight compartments. Inspection covers and drain plugs are provided, and a system of bilge piping fitted by means of which all wate



AS A LANDPLANE : Although designed primarily as a twin-float seaplane, the new Short monoplane can be converted into a landplane by fitting a wheel undercarriage.



THE NEW SHORT TWIN-FLOAT MONOPLANE: General Arrangement Drawings, to Scale.



THE SHORT THREE-ENGINED TWIN-FLOAT MONOPLANE: Photographs of a scale model.

can be pumped out from each compartment by a hand pump from the outside. Towing eyes of stainless steel are fitted to the bows of the floats.

In all large and heavy twin-float seaplanes the wracking stresses set up when the machine is running diagonally to the waves may be considerable, and how to meet these stresses is always something of a problem. In the new Short monoplane the particular system of float suspension to which reference has already been made helps very materially, as the stresses are transmitted through the strutting or outrigger system to the very deep fuselage, which should easily be able to take care of them.

The land undercarriage is of steel tube construction and incorporates a special design of shock-absorbing gear. Wheel brakes are provided, and a wheel type tail skid. Special trestles are provided for use when changing over from float to wheel chassis and vice versa.

Engine Installation

The engines fitted are Bristol " Jupiters " of the Series IX geared type, developing a normal power of 485 b.h.p. each at 2,000 r.p.m. and a maximum of 525 b.h.p. at 2,200 r.p.m. One engine is mounted in the nose of the fuselage and the other two are placed outboard, close under the wing surface, in streamline nacelles. All three engine plates are mounted on rubber blocks so as to reduce to a minimum the amount of vibration transmitted to the aircraft structure. Provision is made for easy inspection and removal of magnetos, carburettors and filters, and access to all engine parts is facilitated by special detachable platforms. The engines are fitted with hand turning gear and priming pump and starting magneto. A Heywood injector gas starter is also provided, connected up to all three engines.

The normal petrol supply is carried in two tanks situated in the wing in such a position that any escaping petrol is blown clear of the machine. The feed to the engines is entirely by gravity, thus dispensing with petrol pumps and consequent complication. The tanks are interconnected, and all three engines can be fed from both or either tank. Small header tanks are fitted in the petrol system close to the engines to counteract the effects of acceleration during take-off. Refuelling pipes are led from the tanks to the underside of the fuselage to facilitate refuelling by pump. Normal filler caps and filters are fitted to the tanks for filling by hand. The propellers will be of wood, but if desired Leitner-Watts metal propellers can be fitted at extra cost and weight.

Passenger Accommodation

The fuselage of the Short three-engined twin-float monoplane is arranged for two pilots side by side behind the central engine. The pilots' cockpit is provided with windscreen and sliding side windows, and a sliding roof for use in very hot climates when the cockpit might become uncomfortably warm. The view from the cockpit should be excellent. The two seats are designed to be raised and lowered during flight. The dual controls consist of foot bars and wheel control.

Immediately aft of the pilots' cockpit is the forward luggage compartment, which provides space for crew's effects, light luggage of passengers, etc. On the starboard side the W/T equipment is installed. A bulkhead with sliding door forms the rear wall of this compartment and the forward wall of the saloon. The latter has seating accommodation for 17 passengers, or 16 passengers and a steward. The seats are arranged three abreast, two close together along the starboard side and the single seats, separated from them by a gangway, along the port side. The dimensions of the saloon are: length, 17 ft. (5·18 m.); height, 6 ft. (1·83 m.); and width, 6 ft. 2 ins. (1·88 m.). Large windows are fitted in the sides of the saloon, capable of being opened. The walls of the saloon are partly lagged with sound-proofing material to reduce external noise as much as possible. Fans will be installed to assist in the ventilation of the saloon. The passengers' chairs will be of a type similar to those used in the " Calcutta " flying boats, which have been found very comfortable and at the same time of low weight. These chairs are of duralumin tubing, upholstered in leather and having seats and back-rests in the form of air cushions which, when detached from the seats, form very effective life-belts in an emergency.

There are two entrance doors to the saloon: one in the port side forward, which is the passengers' entrance and reached by a gangway on the sloping strut from the port float; the other on the starboard side, aft of the main saloon, giving access to the main luggage compartment. On the port side of the luggage compartment, and separated from it by a wall, is the lavatory, completely equipped with folding wash-basin, etc. A sliding door separates the lavatory from the saloon.

Equipment

A very complete electrical equipment is to be carried including navigation lights, interior lighting, riding lights, and " out of control " lights. Provision will also be made for wing-tip flares and dashboard lighting. The dual-purpose generator for electrical and W/T equipment is mounted on the top of the fuselage, immediately aft of the sliding roof over the pilots' cockpit.

The instruments carried will include the usual altimeter, airspeed indicator, etc., and also, if required, a Reid turn indicator, oil-pressure and temperature gauges, etc. Revolution indicators with large dials will be fitted in the wing nacelles, visible from the cockpit, and a tele-tachometer coupled to each engine will give a record of the running of the engines during flight. A P.4 compass is provided for the pilot, and an 0·3 bearing compass for use in navigation. Suitable positions are provided in the machine for the taking of all the necessary readings with the 0·3 compass, and a chart board, and stowage for charts, instruments, etc., is also provided. Arrangements will also be made for the fitting of a periscopic drift-sight on the starboard side of the cockpit.

The machine will be fully equipped with the Marconi A.D.8 transmitting and receiving set, the instruments being placed in a readily accessible position in the forward compartment. The aerial passes out through the bottom of the fuselage and is wound in on a reel when not in use. An emergency aerial, is fitted for use when the machine is at rest on the water, being attached at one end to a mast projecting from the top of the fuselage and at the other to the tail. Complete marine equipment is also to be provided, as well as a special type of gantry by means of which the engines can be changed while the machine is afloat.

Dimensions, Weights, and Performance

The main overall dimensions of the Short three-engined twin-float monoplane are: wing span, 107 ft. (32·6 m.); length o.a., including servo rudder, 69 ft. 8 ins. (21·2 m.); overall height (seaplane), 19 ft. 6 ins. (5·95 m.); overall height (landplane), 15 ft. 6 ins. (4·73 m.). The total wing area, including ailerons, is 1,382 sq. ft. (128·5 sq. m.); area of ailerons, 179 sq. ft. (16·65 sq. m.); area of tail plane, 106 sq. ft. (9·85 sq. m.); area of elevators, 94 sq. ft. (8·73 sq. m.); area of rudder, 50 sq. ft. (4·65 sq. m.); area of fin, 42 sq. ft. (3·9 sq. m.); area of servo rudder, 6·5 sq. ft. (0·605 sq. m.).

The calculated tare weight of the machine, inclusive of saloon equipment, is 12,701 lbs. (5,780 kgs.), and as the C. of A. covers a gross weight of 20,685 lbs. (9,400 kgs.), the disposable load is 7,984 lbs. (3,620 kgs.).

The disposable load may be made up as follows: Petrol (350 gallons at 0·78 lbs.), 2,730 lbs. (1,240 kgs.). Oil (27 gallons at 10 lbs.), 270 lbs. (123 kgs.). Total fuel, 3,000 lbs. (1,363 kgs.). The rest of the load may be made up in the following manner: Crew and kit, 660 lbs. (300 kgs.); 17 passengers and luggage (17 at 210 lbs.), 3,570 lbs. (1,620 kgs.); W/T equipment, 250 lbs. (113·5 kgs.); electrical equipment, 75 lbs. (34·1 kgs.); instruments, 100 lbs. (45·4 kgs.); marine equipment, etc., 200 lbs. (91 kgs.); signal pistol and cartridges, 8 lbs. (3·64 kgs.); fire extinguishers, 21 lbs. (9·55 kgs.); water for various services, 100 lbs. (45·4 kgs.). Total, 4,984 lbs. (2,262·6 kgs.).

The *estimated* performance is as follows: For the machine as a seaplane: Maximum speed at sea level, 136·5 m.p.h. (220 kms./h.); minimum speed, 67 m.p.h. (108 km./h); initial rate of climb, 910 ft./min. (4·63 m. per sec.); service ceiling, 15,000 ft. (4,575 m.); rate of climb on two engines, 300 ft./min. (1·52 m. per sec.); range at cruising speed, 500 miles (800 kms.).

As a landplane the estimated performance is: Maximum speed, 140 m.p.h. (225 kms./h); minimum speed, 66 m.p.h. (106 kms./h.); initial rate of climb, 1,040 ft./min. (5·28 m. per sec.); service ceiling, 16,500 ft. (5,000 m.); range, 500 miles (800 kms.).

Everling Quantities

As the Short three-engined twin-float monoplane has a gross weight of 9,400 kgs., and a normal total power of 1,455 b.h.p., the power loading is 6·46 kgs./h.p. The wing loading is 73 kgs./sq. m., and the " wing power "

$$\frac{1455}{128 \cdot 5} = 11 \cdot 3 \text{ h.p./sq. m.}$$

The Everling " high-speed figure " in the metric-system is thus 16, which is very good for a three-engined machine.

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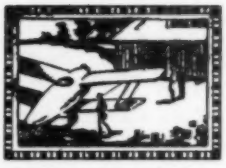
PRIVATE FLYING



A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

LIGHT PLANE TOUR OF EUROPE CONCLUDED

Paris, August 19

WITH perfect flying weather and a large crowd present 25 planes, forming the first contingent of arrivals in the "Challenge International de Tourisme," crossed the finishing line at the Orly Airport on August 14.

In order to make the "Challenge," as far as possible, a contest of "Tourisme" and not simply a race around Europe, the regulations provided that no planes could leave Belgrade before August 9, nor Warsaw before August 11, whilst none of the contestants could be "checked in" at the finish at Orly before Wednesday afternoon, August 14, at 3 o'clock. In consequence of these regulations the 16 leading planes (in point of speed) had arrived at and were waiting at Brussels on Tuesday evening, August 13, ready to cover the last lap to Orly. Among them were Capt. H. Broad and Miss Winifred Spooner, the two English entries, on their Gipsy-Moths. Mr. John Carberry on his Raab-Katsenstein (Cirrus-Hermes), the Italians Signor Lombardi and Signor Bottala on their Fiat A.S.Is., the Germans Herren Offerman, Von Dungern, Morzik, Kirsch, Kneer, and Roeder on their B.F.W., Klemm and Junkers planes, and M. Delmotte, the French pilot, on his Caudron machine.

The Italian pilot, Capt. Mazotti, was at Amsterdam last Wednesday morning, 718 kms. from Orly. Six other contestants passed Tuesday night at Hamburg, 793 kms. distant. Among them were the French entries, Maurice Weiss and Maurice Finat, flying Potez 36, the Germans Dr. Ziegler, Herren Lusser, Siebel and Poss on their "Klemms." Six contestants were also at Berlin on Wednesday morning, among them the Italian entries, Signor Banassati, Capt. Gelmetti, Capt. Gastaldo, and Capt. Guazzetti. All of the foregoing planes were, consequently, within some hours' flying distance of Paris. This situation resulted in the simultaneous arrival of a large number of planes at Orly on the finishing day.

The first plane appeared in the sky about 2.40 o'clock, and began to circle around over the aerodrome. Five minutes later a Junkers machine came in sight, followed by an Italian high-wing monoplane. Miss Spooner appeared about 2.55 o'clock, and Captain Broad about five minutes later. Soon there were some twenty planes encircling the grounds, waiting for the "Controle" to open and be "checked in." This did not open before 3 o'clock, and consequently no arrivals could be recorded before that hour.

A white strip of linen had been laid down on the field running out from a fence, and the planes, flying low, had to cross over this line.

Promptly at 3 o'clock Mr. Matabon, the official "Chrometreur" of the Aero Club of France, gave the signal, and a rapid swoop of planes followed. During the first two minutes 15 machines flew over the finishing line.

The two Italians, Capt. Lombardi and Capt. Botalla, flying their A.S.I. machines, were the first to cross. They were followed immediately by Herr Kneer on his low wing Junkers monoplane, and Maurice Weiss flying his cabin plane.

General view of the first arrivals at Orly on the completion of the Light Plane Tour of Europe on August 14. The two Gipsy-Moths, who alone represented Great Britain, were among them

the Potez 36. The fast Raab-Katzenstein piloted by Mr. J. Carberry was fifth, and the little B.F.W. plane of Herr Offerman sixth. All these planes flew over the finishing line within the first 60 seconds. Miss Spooner landed seventh, 1 min. 4 secs. after 3 p.m., and Capt. Broad sixteenth, 2 mins. 38 secs.

On landing, the machines were drawn up in front of the hangars of the Service de la Navigation Aerienne (Government Department), where the "Commissaires" of the Aero Club proceeded to inspect them. They were weighed again and the amounts of petrol and oil remaining in the tanks was carefully checked. Various parts that had been sealed before leaving, such as cylinders, were inspected.

The pilots were given a most enthusiastic welcome by their friends. Prominent among those present were Mr. Pierre Etienne Flandin, Vice-President of the Chamber of Deputies and President of the Aero Club de France. Mr. Rudolphe Soreau, Vice-President of the Aero Club de France, who has just been named a Commandeur in the Legion of Honour, Mr. de l'Escaille, of the Bureau Veritas, also Chairman of the Contest Committee of the Aero Club de France, Mr. Besancon, the Secretary of the Aero Club, and the constructors, M. Louis Bleriot and M. Rene Caudron, Monsieur Vivent, Sous Directeur of the Air Ministry, and Captain Laurent of the Air Ministry. Lady Bailey, who had flown around the course unofficially, arrived at Orly about 1.30 o'clock, after having lunched at Le Bourget, where she had flown from Brussels that morning. After congratulating her English friends, she left for Croydon about 4.30 p.m. American Aviation was represented by Major John F. Walsh, the Military Air Attache, Commander Wm. D. Thomas, the Naval Air Attache of the American Embassy in Paris, Mr R. C. Wood, of the National Aeronautics Committee of the American Legion, and Captain Cyril Turner, the European Representative of the Fairchild Aviation Co. General Piccio, the Italian Air Attache, was busy receiving congratulations on the good performances of his countrymen, and looking after the various details incident to their arrival. Herr Henry Wronsky, the Resident Director of the Luft-Hansa, who was also on hand, welcomed and assisted the German contestants.

Capt. Broad, when interviewed, declared that the trip had been generally without special incident, except that bad weather had been encountered throughout Central Europe during the first half of the Tour. He declared that his machine and engine had functioned perfectly, and that he had touched nothing during the entire course.

British Engines Excel

MONSIEUR HEINRICHS, the general manager of the Salmson Motor Co., received many congratulations on the performance of his engines. His motors were mounted on the two cabin planes, Potez 36's, the Caudron and three Klemm monoplanes, the pilots of all of which declared that their engines had functioned perfectly and that they were not required to touch them once. Mr. Olney, of the A.D.C. Aircraft Co., who was on hand to look after the Cirrus and Hermes motors, also got the same excellent reports, and Mr. F. E. N. St. Barbe, of the De Havilland Co., was congratulated on the splendid performance of the Gipsy engines.

Attention should also be called to the admirable tour made by the four Romeo monoplanes, equipped with Fiat 85 h.p. motors. They kept together all the way around Europe and returned to Orly in the same perfect formation.

About 4 o'clock adjournment was made to the large room on the ground floor of the office building at Orly, where a champagne lunch was served. Mr. Rudolphe Sorreau, Vice-President of the Aero Club of France, presided. H. congratulated the various contestants on the splendid performances they had made and stressed especially the striking international element of the contest, as shown by the entries from so many different countries.

Mr. Sorreau also called attention to the recent wonderful flight of the Zeppelin across the Atlantic, and predicted that airships and aeroplanes would soon reciprocally supplement the facilities offered by each other. The present contest, Mr. Sorreau continued, was but a beginning in the development and use of light planes. He predicted a great future for them and declared that the Aero Club of France would do its utmost to aid in their development. There were no further arrivals on Wednesday, and this luncheon closed the proceedings of the day.

One arrival was recorded the following day, on Thursday, August 15. It being a holiday the aerodrome was naturally very quiet. Capt. Wirth, the Swiss airman, landed at 2.45 o'clock. He flew a low wing monoplane, Klemm L.25, equipped with a Salmson 40 h.p. motor. The captain made a very good showing on his flight—maintaining regularity. He was entered in the second category and had received 32·5 points in the preliminary trial tests.

It was announced that the B.7 plane of Dr. Ziegler, an Albatross, had been damaged at Turnu-Severin, and had abandoned the tour and that the Breda 15, piloted by Capt. Ferrarin, had also dropped out.

Five planes arrived at Orly on Friday, August 16, as follows: the Belgian pilot, M. Maus, on his St. Hubert, 85-h.p. Walter engine, who landed at 11.57; the Italian, Capt. Suster, on his Fiat monoplane, Fiat motor 85 h.p., who landed at 1.12; the Swiss M. Burkhardt, on his Klemm-Salmson; the German, Herr Croneiss, on his B.F.W. 805 h.p. Genet motor. The French airman, Pierre Lemerre, flying his monoplane Guerchais-Henriot (95 h.p. Salmson motor), also came in from Brussels.

The last arrival of the "Challenge" took place on Saturday August 17, when the Italian, Capt. Donati, flying his Fiat, A.S.I. (85 h.p. Fiat motor) landed at 7.10 p.m. The "Controle" was then declared closed, some three days earlier than had been expected, the regulations allowing it to remain open until, and through, Tuesday, August 19.

It is interesting to note the classification of the arrivals by nationalities. These comprised 13 Germans, 9 Italians, 4 French, 2 Swiss, 2 English, 1 Belgian, and 1 Tchekoslovakian planes; in all 32. Of these, 29 were monoplanes, of which 15 were of the low-wing type.

At the close of the "Controle," the log books of the various planes were taken to the Aero Club, where the results will be "checked up" and the final classification shortly announced.

The sponsors of the "Challenge" have desired to make it specially a competition of tourist planes, that embody useful characteristics. They have desired to show the attractiveness of a tour of Europe by air and thereby to encourage the use of light planes. For this reason, although a large proportion of the points possible to attain will be awarded on the basis of speed, stress has also been laid on other important elements, such as regularity attained on the European circuit, fuel consumption and the practical qualities of the 'planes. The classification is as follows:—Practical qualities of the plane, 40 points; fuel consumption test, 20 points; regularity of arrivals on the European circuit, 35 points; speed in traversing the European circuit, 70 points; total, 165 points.

Speed Performances

As we go to press the final figures have not been given out by the Aero Club de France. Some of the recorded speeds for the tour are as follows: (first category competitors), Mr. J. Carberry, average 96·3 m.p.h. on his Raab-Katzenstein (Cirrus-Hermes); Capt. H. Broad, 95·6 m.p.h., on Gipsy-Moth; Capt.Guelmetti, 91·9 m.p.h., on Romeo 5 (Fiat); and Miss W. Spooner, 90·1 m.p.h. on her Gipsy-Moth. In Category II, the highest speed was 80·1 m.p.h., by Herr Morzik, on a B.F.W. (Siemens).

[By the way, we are unofficially informed that Herr Kirsch had a Cirrus engine in his Klemm monoplane, and not a Siemens as the programme stated.—ED.]

LIGHT 'PLANE CLUBS

CINQUE PORTS FLYING CLUB, LTD.

WEEK ENDING SATURDAY, AUGUST 17.—Pilot instructor: K. K. Brown. Ground engineer: R. H. Wynne. Machines: R.I. and P.M. Total for week: 25 hrs. 20 mins. Dual instruction: Mr. Wynne, 45 mins.; Mr. Cooke, 45 mins.; Mr. T. Bowring, 2 hrs.; Mr. J. Bowring, 2 hrs.; Mr. Calvert, 3 hrs.; Mr. Milton, 3 hrs. 30 mins.; Mr. Dorman, 1 hr. 30 mins.; Lt. Cdr. Gubbins, R.N., 15 mins.; Mr. Hyde, 30 mins.; Mr. V. H. Smith, 1 hr.; Dr. Furlong, 30 mins. Total, 11 members, 15 hrs. 45 mins.

Soloists under instruction: Mr. Cooke, 1 hr.; Lt. Cdr. Gubbins, 1 hr. 55 mins.; Mr. Calvert, 1 hr. 15 mins. Total three members, 2 hrs.

"A" pilots: Mr. R. Dallas Brett, 1 hr.; Mr. K. Edgson Wright, 15 mins.; Mr. Ellis, 45 mins. Total, three members, 2 hrs.

A.A.F. pilots: Mr. Bellville, 1 hr. 15 mins.; Mr. Seely, 30 mins. Total two members, 1 hr. 45 mins. Joyride: 10 mins. Tests: 12–1 hr. 30 mins.

Weather this week was not so good for instructional purposes, and the presence of the 601st (Bombing) Squadron A.A.F., restricted solo flying considerably, with the result that the hours have dropped.

On Thursday, 15th, Lt. Cdr. Gubbins, R.N. (Retd.), of Barham, near Canterbury, passed his " A " licence tests in excellent style. He took P.M. up to 7,000 ft., and back in 25 mins., which is the shortest time so far taken by any member on height test. We heartily congratulate Lt. Cdr. Gubbins, who was one of the original members of the club, on having passed through in spite of many difficulties, and on putting up such a very excellent performance.

On the same day, Mr. H. Calvert, of Hildenborough, was successfully launched solo, and made several landings which were consistently good. We hope to see this member qualify very shortly.

Dr. Furlong of Waterford, is a new member who commenced instruction during the week.

On Sunday, 18th, we had the honour of a visit from Sir Arthur and Lady Whitten-Brown, and Mr. and Mrs. Nicholson (the Town Clerk of Folkestone and his wife). In case there are still any people who have been convinced by American publicity that Col. Lindberg was the first person to fly the Atlantic, may we remind the public that Sir Arthur Whitten-Brown flew the Atlantic from West to East with the late Sir John Alcock as long ago as 1919. Sir Arthur and Lady Whitten-Brown had tea in the Club Room and were interested in the working of the club.

MIDLAND AERO CLUB

FORTNIGHT ENDING AUGUST 17.—The total flying time was 82 hrs. 2 mins. Dual, 52 hrs. 25 mins. Solo, 20 hrs. 20 mins. Passenger, 7 hrs. 5 mins. Cross country to Stag Lane, 1 hr. 45 mins. Test, 27 mins.

The following members were given dual instruction by Messrs. W. H. Sutcliffe and T. W. Nash, A.F.M. : Messrs. H. E. Evans, J. R. Bond, S. J. Eardley Wilmot, B. P. A. Vallance, F. Norman, C. T. Davis, F. J. Lydall, G. Norton, Mrs. Burnett, Major D. Thomson, P. M. Patel, T. W. Wild, G. Mander, J. E. Yardley, H. Coleman, H. A. Taylor, P. Stone, F. G. Robinson, Mrs. Vereker, J. W. Astley, A. C. T. Isaac, P. B. Hackett, L. W. Farrer, A. F. Hill, T. B. Hallam, A. Methley, Harvey Sangster, J. H. Vickers, T. G. Ellison, E. C. Merrick, G. P. Haylock.

Advanced dual : Messrs. H. J. Willis, R. B. Laidlaw.

" A " pilots : Messrs. J. K. Morton, S. H. Smith, W. Swann, J. R. Bond, W. Evershed, R. L. Jackson, H. J. Willis, J. Rowley, R. C. Baxter, P. B. Hackett, R. B. Laidlaw, W. M. Morris, F. J. Steward, E. D. Wynn, G. C. Jones.

Soloists : Messrs. H. E. Evans, F. Norman, H. A. Taylor, F. T. Lydall, S. J. Eardley-Wilmot, Major D. Thomson, B. P. A. Vallance, H. Coleman.

Messrs. F. Norman, S. J. Eardley-Wilmot, and B. P. A. Vallance successfully made first solos.

Passenger flights were given to 20 members.

On August 16, LT was flown to Stag Lane for annual overhaul for renewa of C. of A.

SUFFOLK & EASTERN COUNTIES AEROPLANE CLUB

AUGUST 17.—Chief instructor : G. E. Lowdell, A.F.M. Instructor : H. M. T. Clayton. Ground engineers : T. Mayhew, H. Brown. Aircraft " Bluebirds " RE SZ BE, UH. (Suffolk Aero Club).—Total flying time, 16 hrs. 35 mins. 12 members were given dual instruction, 15 hrs. 30 mins. Members flew solo under instruction, hrs. mins. " A " and " B " licence pilots flew hrs. mins. 12 tests were made, 1 hr. 5 mins. Two passengers were carried 10 mins.

An International Air Rally will be held at Hadleigh Aerodrome on August 31 to September 1. There will be bomb dropping and landing competitions for visiting pilots.

Prizes, " On to Hadleigh Rally," First, £25, second, £10, third, £5.

Bombing and landing competition : First, £3, second, £2. (Cambridge Aero Club).—Total flying time, 15 hrs. 15 mins. Eight members were given dual instruction, 9 hrs. 35 mins. Four members flew solo under instruction, 1 hr. 35 mins. " A " licence pilots flew, 1 hr. 15 mins. Seven tests were made, 1 hr. 20 mins. Nine passengers were carried, 1 hr. 30 mins.

Sir Bruce Stewart performed a successful first solo after six hours instruction.

THE NORTHAMPTONSHIRE AERO CLUB

JULY REPORT.—Dual instruction, 36 hrs. 25 mins. Solo flying : 10 hrs. 15 mins. Passenger flying : 14 hrs. 5 mins. Tests : 7 hrs. 10 mins. Total, 67 hrs. 55 mins.

Week-ending July 27 was our record week, total time being 24 hrs. 35 mins. New flying pupils six, including two lady pupils.

To AUGUST 17.—Instructor : E. F. Palmer. Ground engineer : J. B. Gallagher. Aircraft (two), IC, IE. Dual instruction : 5 hrs. 20 mins. Solo : 3 hrs. 20 mins. Passenger : 1 hr. 25 mins. Tests : 1 hr. 35 mins. Total : 11 hrs. 40 mins.

The first two members of the club to obtain their " A " licences are Mr. K. Whittome and Mr. J. Tomkins, having completed their tests a month ago.

FROM THE FLYING SCHOOLS

Phillips and Powis School of Flying, Reading Aerodrome

WEEK ENDING AUGUST 15.—Flying time : 20 hrs. 25 mins. Instructors : Flg. Off. R. T. S. Shepherd, Mr. H. B. G. Michelmore. Notes : Miss Wodehouse and Messrs. Henderson, de Frair and Whisham have this week joined the school, and are all making satisfactory progress.

STAG LANE NOTES

An Airminded North Country Newspaper.—The *Newcastle Evening World* has placed an order for a Gipsy-Moth with extra tankage which will give it six hours' range. This newspaper, in order to foster aviation, has decided to offer ten free training scholarships for men and women between the ages of 17 and 35. The selected applicants will be referred to the Newcastle Aero Club and taken for a flight in one of the club's Moths, by Mr. G. S. Kemp, their chief instructor. The club committee will then choose 10 for complete training up to the " A " licence, and the 10 qualified pupils will further be admitted to membership of the club for one year.

No favouritism is to be shown either to men or women applicants and the proportion of each will be decided on the general suitability of candidates. Further particulars may be obtained from the editor, *Newcastle Evening World*, whose words concerning the idea are that 10 good north-country pilots shall be turned out. Instruction of the first two or three pupils will begin as soon as they are selected and the necessary brief formalities completed.

" Moth " as Sleuth.—An amusing story comes from Canada. At a farm near Sydney, Nova Scotia, Maj.-General J. H. McBrien, President of the Canadian Aviation League, noticed when taxying in that at one point his tail skid appeared to sink into what seemed to be a hard bumpy level. Investigation revealed a cache of 20 barrels of rum concealed under sticks and covered with a layer of mould. The contraband has now been seized by the authorities. It is perhaps worth recording that Maj.-General McBrien was presented with his Moth about a year ago by Sir Charles Wakefield.

Statistics.—The authenticated total mileage of the world's regular air routes now in operation, taken up to the middle of June, 1929, is given as 93,365 miles. In this connection, it is perhaps interesting to record that from statistics in the De Havilland Co.'s possession, they compute that since the first Moth was produced, 4½ years' ago, an aggregate of more than 10,000,000 flying miles has been compiled on them.

A Fast Trip.—Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, recently flew from London to Le Touquet in his own Moth, G-EDCA, in 50 mins., giving an average of 130 m.p.h.

Gipsy-Moths for East African Air Routes.—A revival of interest in aviation in East Africa is indicated by the formation of a company to be known as " Wilson Airways," to provide inland and coastal services. A Gipsy-Moth, which will start the service, has already been delivered.

An interesting feature of the undertaking is that the controlling financial interest is held by a lady, Mrs. F. K. Wilson, widow of a Kenya settler. Mr. T. Campbell-Black will be managing-director. Coastal services will be run to Mombasa, Tanga, Zanzibar and Dar-es-Salaam. If occasion offers the line will be extended to Beira, Portuguese East Africa, which will bring Johannesburg and Capetown within five and seven days, respectively, of Nairobi. It is further intended to provide links with the main Cape to Cairo route.

Aero Exhibition.—The D.H. company states that the first " sold " ticket to be attached to any machine at the Aero Exhibition was attached to the metal fuselaged Gipsy-Moth landplane which formed part of the de Havilland exhibit. This machine was sold to M. Andre Jomain of Paris, the machine, of course, being purchased as it stood with special show finish. M. Jomain took his " A " licence in September, 1926, and in the course of 350 hrs. flying has never had an accident of any sort. He already owns two Moranes.

For the Antarctic.—Gipsy-Moth seaplanes have lately been delivered for use on two Antarctic Expeditions. The first is the British, Australian and New Zealand Antarctic Expedition 1929-1930, which lately sailed in the " Discovery," under the leadership of Sir Douglas Mawson, F.R.S., B.E. The fact that a Gipsy-Moth seaplane has been selected for the operation over some of the most hazardous territory in the world is perhaps pardonably regarded by the company as a feather in its cap. Wireless equipment is carried on the Moth, but this is confined, for reasons of weight, to a receiving set.

In the second case a Gipsy-Moth seaplane has been supplied for the Norwegian Antarctic Whaling Expedition which has just left in the whale ship ss. " Kosmos " (23,000 tons). The pilot, Mr. Lief Lier, who assisted in the search for General Nobile at the North Pole, recently flew the machine from Stag Lane Aerodrome and reached Gothenburg in 8 hrs. flying time. This Moth seaplane is, incidentally, the actual machine which formed part of the de Havilland exhibit at the Aero Exhibition, and was purchased through National Flying Services. Its colour scheme is white and yellow, with exhaust pipe, etc., chromium plated.

Aircraft have been used before for searching for seals off the Canadian coasts and for herrings off the Scottish coasts. but it is stated that this is the first occasion on which an airman has been called to spot whales. It is anticipated that the pilot will be able to secure valuable information as to the best way through the ice floes and so save the expedition much time in working through a given area.

AIRISMS FROM THE FOUR WINDS

Graf Zeppelin's Record Flight

THE *Graf Zeppelin* set up a record non-stop airship flight of 7,000 miles, when it reached Tokyo, Japan, on August 19, 101 hours after starting from its base at Friedrichshafen, Germany, representing an average speed of about 70 m.p.h. This was the first stage of its world cruise, although one must remember that it flew to America and back recently, in order to take on board American passengers. The course taken by the vessel led through the north of Germany and across Siberia. Almost constant wireless communication marked the progress. On the whole, the weather was fair, although many detours were made to avoid storms, particularly in Siberia. It is interesting to note that its flying time for the voyage was a few hours less than anticipated. In order to economise with fuel, one or two of the engines were often kept in reserve. The landing in Japan took place at a naval station close to Tokyo, after a slight battle with rain squalls down the Japanese coast. Beside the crew of 40, there were 20 passengers, who included Sir Hubert Wilkins and Lady Drummond Hay. In command was Dr. Eckener. Japan gave the vessel a great welcome. The next stage of the world flight, which is likely to begin shortly, is across the Pacific to Los Angeles. Then will come a flight across America to Lakehurst, and the return to Friedrichshafen after another Atlantic flight.

Swiss Atlantic Attempt

Two Swiss airmen, Capt. Kaeser and M. Tschopp, pilot and navigator, respectively, left Lisbon on August 19 in a Farman machine fitted with a Gnome-Rhone Titan engine, to fly the Atlantic *via* the Azores. The machine was sighted over the Azores at 6 p.m. the same day, approximately 10 hrs. after the start. The airmen proposed to land at Halifax, Nova Scotia, for refuelling, and then proceed to New York. They have not been sighted since passing the Azores and are now overdue.

American Airwomen's Race

NINETEEN women pilots entered for an air race from Los Angeles to Cleveland, Ohio, on August 19. Men were not allowed to accompany them, but were permitted to fly a mile astern and render assistance in the case of forced landing! Miss Phoebe Omlie led the field at the first stage, at which all the competitors landed. One of the competitors, Miss Marvel Crosson of San Diego, was later found dead in Arizona with her machine wrecked. We published in "FLIGHT," July 4, an interesting story of Miss Marvel's flying achievements.

U.S.A. and South American Air Service

AN air passenger service between Argentina, Chile and the United States was inaugurated at Buenos Aires on August 14 with the departure of an aeroplane with seventeen passengers on board for Santiago.

Mails to Australia

THE Australian and New Zealand Section of the London Chamber of Commerce have discussed the hastening of the delivery of mails between this country and Australia by a development of the existing air mail services. The meeting decided to ask Sir Granville Ryrie, the High Commissioner for Australia, to fix a date on which he will accompany a deputation to the British Postmaster General in order to urge him to secure an extension of the Indian Air Mail service from Karachi, its present destination, to Bombay, Madras and Colombo. The deputation will point out that if the air mail can be extended to the last port, more urgent letters and packages can be carried from Britain to Colombo by aeroplane, and from there transferred to steamship for carriage to Freemantle. Similarly, Australian mails to Britain can be picked up by the air mail at Colombo for quick transport to London. It is calculated that by this plan a saving of at least a week could be made, and that the additional freight would help to make the existing Indian air mail a more satisfactory service.

New African Aviation Company

A COMPANY, to be known as the Imperial Airways of South Africa, has been registered at Pretoria. The objects of the company are to carry on the business of aerial transport, and to act as agents of and in connection with Imperial Airways, Ltd.

The Atlantic Seadrome

IT is expected that the first American Seadrome proposed for anchorage in the Atlantic for future trans-Atlantic aircraft, will be ready for use next year. It will be like a floating island, 400 ft. wide, 1,200 ft. long, and with a landing deck 70 ft. above sea level. When these islands are anchored at intervals across the Atlantic buoys will be placed between them at distances of 50 miles, equipped with lights and fog-signalling apparatus.

Dutch East Indies Service

AT the beginning of September a regular fortnightly air service for mail and passengers between Holland and the Dutch East Indies will be opened by the Royal Dutch Air Service.

Russian Long-Distance Flight Delayed

M. SHESTAROFF, the pilot of the Soviet aircraft *Land of the Soviets*, which is attempting a flight from Russia to New York *via* the Pacific, reported on August 15 from Sosnozersk, about 50 miles from Chita, that he had made a forced landing.

East African Notes

MR. R. R. BENTLEY arrived at Nairobi in July on his Cirrus "Moth" G-EBSO with a Mr. Filsinger, of the Royal Baking Powder Co., as passenger. Their intention is to proceed to Berlin, where the passenger has been sent on urgent business by his company. In a wireless talk from Nairobi Mr. Filsinger spoke in enthusiastic terms of his trip from South Africa. The first machine of Wilson Airways—a Gipsy "Moth"—has arrived in Nairobi and the pilot is fully employed.

German Air Link with the "Bremen"

A GERMAN machine landed at Cherbourg from Cologne on August 15, and deposited, on board the liner *Bremen*, 21 mail bags destined for New York. A seaplane met the liner when it approached New York and took off the mail, which was delivered exactly four days after leaving Berlin.

Ransomed Airmen

THE crew of the Dakkar-Casablanca air-mail liner, which was forced to land in rebel territory recently, has been ransomed and is now at Piznit. The mails have also been recovered.

Aviation Conference in Warsaw

A CONGRESS of the International Federation of Aviation Societies opened in Warsaw on August 16.

French Record with "Genet" Engine

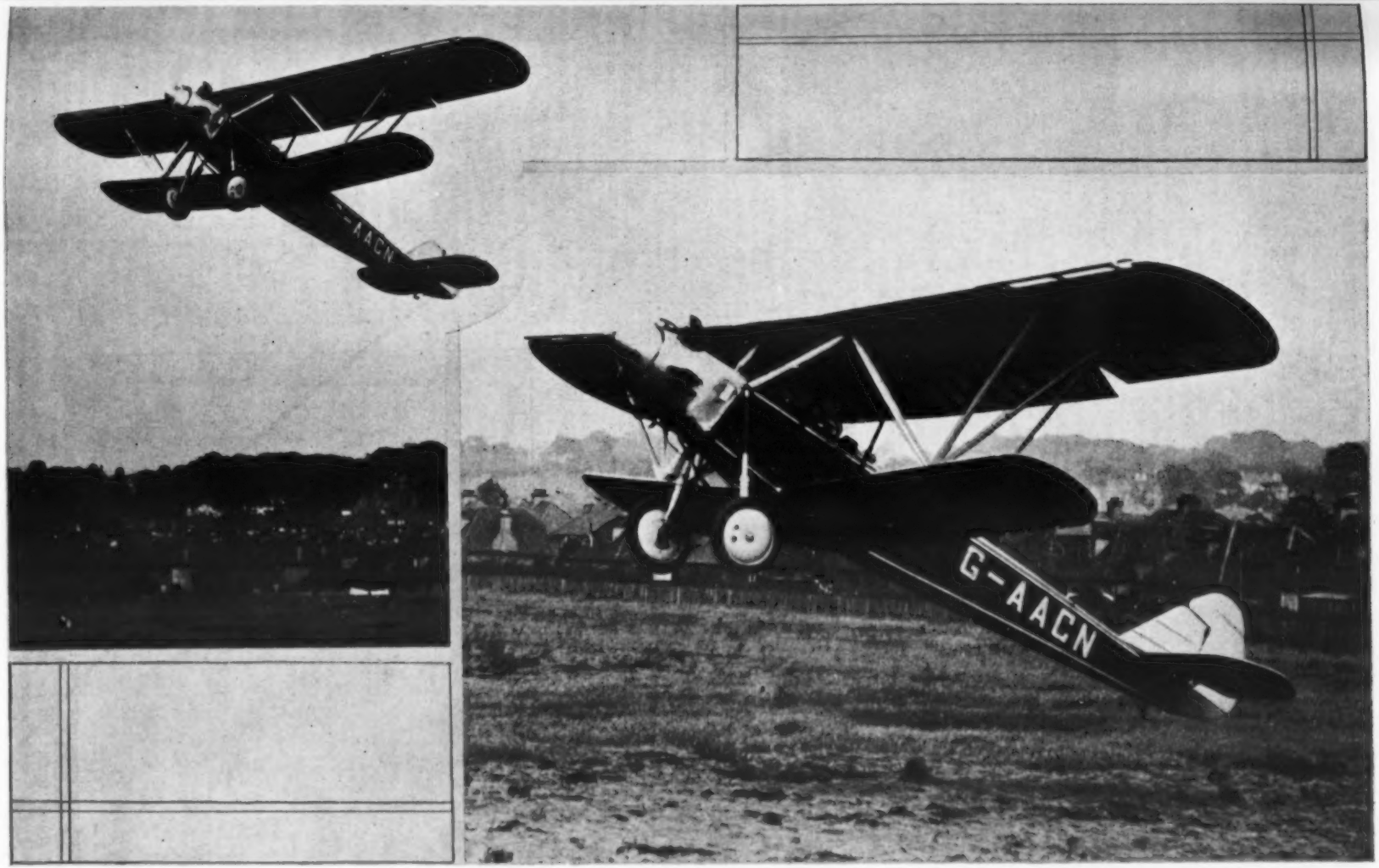
A French Albert Monoplane fitted with an Armstrong-Siddeley "Genet" engine, piloted by M. Albert, recently made a successful attempt on the French altitude record for machines of this type. The height recorded was 6,540 metres (21,255 ft.) which was 1,005 metres (3,276 ft.) better than the previous French record and only 192 metres (624 ft.) lower than the world's record. M. Albert states that he would undoubtedly have beaten the latter had he not run into a thick bank of fog.

Prince of Wales Flies to Le Touquet

DURING a recent week-end, the Prince of Wales flew to Le Touquet, the French coast resort, to spend a brief holiday. He returned by air on August 12.

Australian Air Survey

THE aerial expedition to Central Australia, under the leadership of Mr. Cecil Madigan, which left Melbourne on July 29, is expected to return to Adelaide on August 22. It has flown over 30,000 square miles of mostly unknown country in the south-east of Central Australia, and Mr. Madigan thus sums up his experience:—"Observation indicated that this is the best place in Australia in which to dispose of old razor blades." Photographs of 15-mile strips were taken at an altitude of 10,000 ft. The aeroplane arrived at Oodnadatta, after flying 400 miles over unknown territory, and Mr. Madigan was satisfied that this area is a perfect desert of sand hills. He says it would be suicide to try crossing it even on camels, but very useful information was obtained, as residents of Central Australia have always wanted to know what the country was like.



A "GUGNUNC" JAMBOREE : The Machine designed and built by Handley Page, Ltd., for the Guggenheim Competition is liberally slotted. That it has both lateral stability at large angles and a steep angle of climb is shown by these two photographs, which show the machine just after leaving the ground and well away. The engine fitted is an Armstrong-Siddeley "Mongoose." ("FLIGHT" *Photos.*)

BOOK REVIEWS

AVIATION is now a constant source of topical interest. It is definitely "news" to a public even beyond the flying public. We have daily evidence of this. In spite of the large output of aviation literature this public is eager for more. Very little goes begging. Some of the best of this literature is produced by aircraft companies. We have before us a group of new publications issued by the industry, all of which merits praise and deserves its place. For instance:

Your Aeroplane—Care and Maintenance is the subject of a booklet issued by Shell-Mex, Ltd. The company wisely secured leading aviation authorites for writing this work. Each authority deals with the aspect of the subject with which he is most familiar. The ground thus covered by their collective efforts is considerable. There are fourteen chapters. There are, for instance, Captain A. G. Lamplugh, the insurance expert, and Sqdr.-Ldr. T. England, the slotted-wing expert, jointly discussing safety devices. It needs no imagination to grasp the significance of this co-operation. Captain A. G. Lamplugh must revere Mr. Handley Page as the greatest protector of aviation insurance who has appeared upon the horizon. When every machine is fitted with Mr. Handley Page's slots, one imagines that Captain Lamplugh will have nothing to do but collect premiums. He should never have to face claims. That will be his just reward for all his pioneering work. The loving care which he now shows in our young pilots will not be necessary!

Other chapters in this excellent production of Shell-Mex, Ltd., are "Flying as a Career" by Mr. C. G. Colebrook, the prolific aeronautical correspondent of *The Times*, "The Importance of Aviation," by Major C. C. Turner, of the *Daily Telegraph*, who always writes with a sure touch, and "Modern Tendencies," by Mr. F. Sigrist. Further, Mr. W. S. Farren discusses the "Theory of Flight" with agreeable lucidity, assisted by simple diagrams. Mr. H. L. Hall, chief engineer, Imperial Airways, opens his expert knowledge of Care and Maintenance to the reader.

Considerable thought and care has been lavished on "Your Aeroplane," and every private owner and club member will be wiser for reading it.

Halton R.A.F. Apprentices' Belgium Guide:—It is beyond question that the youths of this country, who seek their future in the world through the training and guidance of the Royal Air Force choose one of the finest ways. To-day, a life in the Royal Air Force can be regarded as an intellectual experience as compared with any Service life in the past. The ideals of the Air Force lean more to the elevation of the mind, rather than strive to create a military machine of a man. The lowest ranks are given every opportunity to mould themselves into useful citizens, as well as Service men.

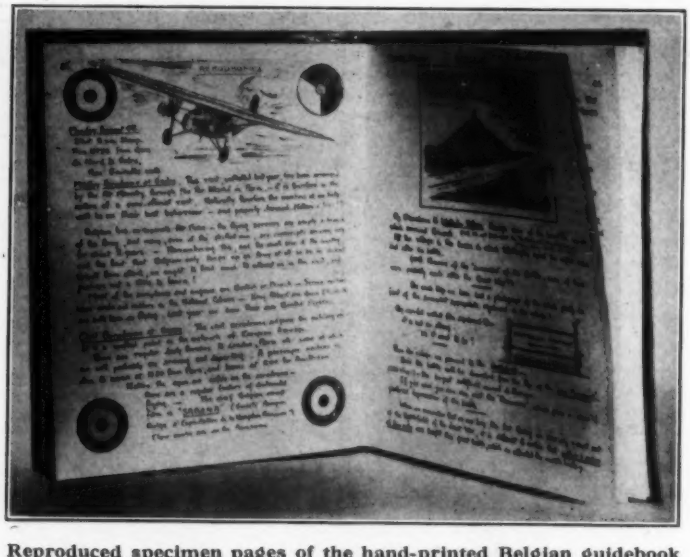
These reflections are stirred in us by an example of this idealism. We have received, with exceptional pleasure, a copy of a hand-printed book which has been entirely produced by the Halton Aircraft Apprentices in connection with their annual conducted holiday tour of Belgium, with brief excursions into Holland and France.

This year's tour was the fourth of its kind, and it becomes more popular every year, in spite of decreases in pay. Each apprentice pays his own fare, although his total expenses do not amount to the sum which an individual visit would accumulate.

The organising of the tours to give an instructive holiday to boys who might otherwise never visit the Continent is carried out by Halton officials. This year, the conductors were Mr. A. C. Kermode, of the Halton Schools, and Mr. Whittaker, who have been associated with previous tours. Mr. Kermode was the first Hon. Secretary to the Halton Aero Club. Last year, it was decided to print a sheet of useful information, on lines different from the conventional guide-book, from particulars given by the members of the party. Not unnaturally, the sheet developed into a leaflet, and then into a handbook of 44 pages, and it proved so successful that the production was repeated this year. The result is worthy of the highest appreciation.

Our only qualms in recommending it is that our readers will desire to own a copy, and they must be disappointed, because the handbook is produced by the party for the party. The contents are as unusually expressed as the hand printing, which is complete with all blemishes, to preserve its value as a publication—is unique in these days of mechanical printing. As a guidebook, it is an encylopædia of knowledge without tears—in fact, with delightful youthful humour. Almost the entire route to Belgium and back, and every place selected for visits are thoroughly described in a personal vein. History is served from an unusual angle and with a light touch, and admirably illustrated with coloured thumbnail sketches. Some of the flippant observations are typical of youth, but they contain a grain of truth. Amongst the contributors are names of importance in the Services, and in literature. Air Commodore M. Bonham Carter, Air Officer Commanding, Halton, chooses a few lines from Kipling's "If," reproduced in his (the Air Commodore's) own handwriting.

General Lord Horne, Capt. A. F. B. Carpenter, V.C., R.N., write messages, whilst two professional authors, "Sapper" (Lt.-Col. Hc. McNeile), and "Ian Hay" (Major Beith) contribute prose sketches of war-time events in the areas visited by the Halton Party. A suitable preface, reflecting the idealism which animates those who are responsible for these tours is written by Mr. A. C. Kermode. The handbook is dedicated to the Belgian people. It should be available beyond the confines of the originators, for it would be an excellent possession for any visitor to Belgium.



Reproduced specimen pages of the hand-printed Belgian guidebook written and published by the Halton Aircraft Apprentices for their annual Belgian tour. On the left page are descriptions of Belgian aerodromes with Belgian aircraft markings in the correct colours, whilst the opposite page is illustrated with a sketch (top) of Waterloo, which was visited. ("FLIGHT" *Photo.*)

The World on Wings:—This is a publication of good style and appearance by National Flying Services, Ltd., which thoroughly explains their scheme. Capt. the Rt. Hon. F. E. Guest contributes a leading article setting forth the excellent opportunity which the N.F.S. scheme now offers for learning to fly. Captain N. Stack, the chief pilot, writes a reassuring article on the art of learning to fly, and reduces the sensations and difficulties of the beginner to the right proportion, so that the prospective pupil should start with 100 per cent confidence. The reputation of Capt. Stack and the other N.F.S. pilots who make "Stack's Circus" at Hanworth should assuage any preliminary fears and doubts.

One of the most useful articles in this book is that by Major Henry Petre, who is a private owner possessed with enthusiasm for the sport of flying which is still increasing after

18 years' flying experience. A most illuminating analysis of his flying expenses for a year with a D.H. "Moth" is a feature in his article. His experience, which is entirely favourable, leads him to conclude with a note of wisdom which we give wider publicity to by repeating here. He says: "Have your machine fitted with slots. They take the place of experience and eliminate the one serious risk attendant on flying." Most of the other contributors to this book are practical airmen whose guidance, wisdom and advice can be readily accepted. In spite of FLIGHT's photographic contributions to "The World on Wings" one must refer to the excellent illustrations.

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GREAT BRITAIN'S COMPETITORS AND SOME NOTES ON CALSHOT

(*Continued from page* 896.)

Italian Team

Our competitors from Italy are as follows:—Lieut.-Col. Bernasconi will be the team commander. He is in command of the training school for M.I.V.H. speed pilots at Senzano, and was formerly a pioneer pilot of seaplanes. He will not, however, take part in the race, in order to be able to be in charge of the organisation.

The other members of the team are:—Pilots, Capt. Motta and Capt. Canaveri, with Lieut. Monti and Lieut. Cadringher, and non-commissioned pilots Dal Molin and Agello.

From among these pilots three will be chosen to compete in the race itself, while the others will form a reserve.

Sergt. Agello was injured when the Fiat seaplane, in which he was carrying out a practice flight for the great air contest at Calshot on September 7, crashed and sank in Lake Garda. The seaplane was wrecked, but Agello was saved by mechanics at the Lake Garda air depôt. This is the second Italian machine to be wrecked, another seaplane crashing on July 16. The Fiat machines constructed for the Schneider Trophy are equipped with Fiat engines of 1,000 h.p., but capable of developing 1,200 h.p. for racing.

Warning to Aircraft near Calshot

The Air Ministry notify all airmen that the Royal Air Force High-Speed Flight, temporarily stationed at Calshot, are carrying out practice flying in the vicinity of Calshot until the Schneider Trophy contest on September 7, and foreign teams will also be practising in the same area until the date of the contest.

The practice area is that bounded by Calshot Castle, Stone Point, Egypt Point, Hillhead, Chilling, Calshot Castle, and pilots of civil aircraft are warned not to enter the area under 1,500 ft. unless they are proceeding to or from the R.A.F. seaplane station, Calshot. When high-speed aircraft are practising the following signals will be displayed from the end of Calshot Spit:—

One white strip 18 ft. by 3 ft. as soon as the aircraft leave the slipway.

A second strip will be placed across the first when the aircraft takes off.

The second strip will be removed immediately all high-speed aircraft engaged in practice flying have landed.

Pilots of aircraft proceeding to the R.A.F. seaplane station, Calshot, should, as far as possible, remain outside the practice area and exercise the utmost caution in landing when the above-mentioned signals are displayed.

Brief History of Calshot

In view of the world-wide interest in Calshot Air Base as the venue of the Schneider contest a brief history of the base is timely:—Following the creation of the Royal Flying Corps in May, 1912, the British Admiralty, in reviewing the whole broad policy of the employment of aircraft in naval operations, decided that a regular chain of air stations should be gradually established at points along our coasts from Scapa Flow to Pembroke, to serve as starting points and bases for naval aircraft working with the squadrons and flotillas at sea.

One of the places chosen under this scheme was in the Portsmouth Command, and in April, 1913, a seaplane station was established adjacent to Calshot Castle under the command of Lieut. Spenser D. A. Grey, R.N. The original station consisted of three sheds, giving accommodation for 12 seaplanes, while the personnel were housed in the coastguard stations at Calshot and Warsash.

The seaplane—at that time in its infancy—called for considerable trial and research, and the Calshot base, up to the outbreak of war, was mainly used for experimental purposes both as regards seaplanes and armaments.

Then the war came, and Calshot, being at that time outside the zone of hostilities, was given the task of training seaplane pilots of the Naval Air Service. This duty remained the chief concern of the base until the autumn of 1916, when the activity of German submarines in the Channel caused increasing demands on the station for patrol work. In September of that year so disquieting was the submarine position in the Channel that the Commander-in-Chief at Portsmouth asked that a seaplane patrol should be established at Portland and Bembridge to supplement Calshot. The proposal was approved by the Admiralty, and four Short seaplanes were based at Portland and four at Bembridge.

In May, 1918, an additional seaplane station at Newhaven was added to the Group, while in July the airship base at Polegate was transferred from the Dover Command. In the same month, in order to facilitate a cross-channel patrol between Calshot and the French coast, a further sub-base was established on the French side at Cherbourg.

During the year 1917, over 3,500 hours were spent in the air by seaplanes of the Group, either in search of hostile submarines or escorting merchant ships and convoys through danger zones. In addition to this anti-submarine work, the base at Calshot still continued to train seaplane pilots. No fewer than 270 pupils passed through the school during 1917, and after October, when an additional training station was opened at Lee-on-Solent, a further 29 were passed through this school also. The combined training schools, therefore, passed out a total of 299 pupils—an average of 5·75 pilots per week for the year.

On the formation of the Royal Air Force, April 1, 1918, the Portsmouth Group, whose headquarters were then at Warsash, became redesignated No. 10 Group, R.A.F. Further expansion took place during 1918.

After the Armistice the Group was gradually reduced and Calshot became a school of naval co-operation and aerial navigation.

In the spring of 1922 some F.5 Flying Boats and R.A.F. personnel belonging to No. 230 Squadron, Felixstowe, were transferred to Calshot to amalgamate with the Naval Co-Operation Flight, which was equipped with F.5 and F. 2a type flying boats.

In 1926, Coastal Reconnaissance Pilots' Courses were substituted for Seaplane Training Courses. Instruction in Air Pilotage continued and Long Navigation Courses of one year's duration for a small number of officers were commenced.

In 1927, the High Speed Flight, R.A.F., arrived at Calshot from Felixstowe to train for the contest for the Schneider Trophy, and left in August for Italy, where it won the race.

A detachment of the High Speed Flight arrived from Felixstowe in February, 1928, to make a bid for the world's speed record for seaplanes. An unsuccessful attempt was made on March 12 of that year, the pilot, Flight-Lieut. S. M. Kinkead, D.S.O., D.S.C., D.F.C., being killed. The detachment returned to Felixstowe in April.

In September, a detachment of the High Speed Flight again arrived at Calshot to make a further attempt on the World's Speed Record for seaplanes. Flight-Lieut. David D'Arcy Greig, D.F.C., A.F.C., flew at an average speed of 319·57 m.p.h. on the three kilometre course—the fastest speed so far accomplished.

In April, 1929, the High Speed Flight, commanded by Squadron-Leader A. H. Orlebar, A.F.C., arrived at Calshot from Felixstowe for training and research work, with a view to competing in the 1929 Schneider Trophy contest.

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A Supermarine Invitation

THE Supermarine Aviation Works, Ltd., will have limited accommodation for marine aircraft of visitors who may be flying to England for the Schneider Trophy contest. Three mooring buoys will be available at the company's erecting shops at Hythe, also facilities for refuelling and filling up with oil.

Early application should be made direct to the Southampton works by those who may wish to take advantage of the facilities mentioned above.

AIR MINISTRY NOTICES

AIR MINISTRY NOTICE TO AIRMEN

The Air Pilot (1929 Edition), Volume I, Air Pilot Monthly Supplements and Notices to Airmen

A.—The Air Pilot—Volume I

1. VOLUME I of a new edition of *The Air Pilot*, entitled "The Air Pilot, Volume I, Great Britain and Ireland," has now been published by H.M. Stationery Office, and is obtainable at the price of 12*s.* 6*d.* net from H.M. Stationery Office, or 13*s.* 3*d.* post free from FLIGHT office, 36, Great Queen Street, Kingsway, W.C.2.

2. This volume generally supersedes the first edition of *The Air Pilot* which was published in November, 1924. It contains information regarding the conditions affecting civil flying in Great Britain, Northern Ireland and the Irish Free State, and is complementary to the undermentioned maps, further particulars of which are given in Notice to Airmen No. 23 of the year 1929:—

(i) The Ordnance Survey Ten-Mile Map of Great Britain (Special Air Edition).

(ii) The ½-in. Ordnance Survey Maps of England and Wales, and of Scotland (Civil Air Editions).

3. The first (1924) edition of *The Air Pilot* should therefore be considered as cancelled, with the temporary exception of paragraphs 7, 8, 8*a* and 8*b*, the List of Contracting States to the International Convention for the Regulation of Air Navigation and certain foreign information in Part III of the Appendix, which will remain effective (unless amended by a Notice to Airmen) until the publication of *The Air Pilot, Volume II* (see Section E below).

4. The loose-leaf system of binding adopted for the first (1924) edition, in order to facilitate the insertion of amendments and additions, has again been employed for the new (1929) edition of *The Air Pilot*, and an alphabetical index has been included.

5. The scope of the volume is indicated by the following synopsis of the contents:—

PART I.—*Great Britain and Northern Ireland*

Chapter I.—General Information. §1. International Air Convention—§2. British Air Navigation Regulations—§3. Log Books—§4. Customs Forms—§5. Civil Air Maps—§6. Magnetic Compasses in Aircraft—§7. Procedure for Swinging Airscrews—§8. Securing of Loose Articles in Aircraft.

Chapter II.—Pilotage Directions. §§9–14. Air Routes—§§15–17. Customs—§18. Prohibited Areas—§19. General Safety Provisions—§20. Danger Areas—§§21–23. Special Warnings—§24. Aeronautical Ground Marks—§25. Air Lights—§26. Unmasked Marine Lights.

Chapter III.—Meteorological Services. §§27–30. General Information—§§31–38. Special Service on Regular Air Routes—Plates I, II and III. Meteorological Map Symbols.

Chapter IV.—Radioelectric Services. §39. Radio Operator's Handbook—§40. Services Available—§41. Special or Additional Services—§42. Direction-Finding Service—§43. Responsibility of Secretary of State for Air—§44. List of British Aeronautical Ground Stations—§45. List of British Direction-Finding Stations.

Chapter V.—Air Stations. §46. Introduction—§47. Lists of Air Stations—§§48–62. Conditions Governing the Use of State-owned Air Stations—§63. Charges Levied at Civil Air Stations other than State-owned—§§64–65. Markings and Signals at State-owned Air Stations—Air Station Schedules.

PART II.—*Irish Free State*

Chapter I.—General Information. §1. International Air Convention—§2. Air Navigation Regulations—§3. Passports.

Chapter II.—Pilotage Directions. §§4–6. Air Routes—§7. Customs—§8. Prohibited Areas—§9. Danger Areas.

Chapter III.—Air Stations. §10. Introduction—Air Station Schedule.

The air station schedules included at the end of Chapter V provide full details of all aerodromes, landing grounds, seaplane stations and airship stations in Great Britain and Ireland, including public, private and Royal Air Force stations, which are available for use by civil aircraft. Each schedule is illustrated by a map on a scale of 1/126,720 (½ in. to 1 statute mile), showing the position and shape of the air station concerned. Plans on a scale of 1/10,000 (6,336 inches to 1 statute mile), are provided for all civil air stations available for public use.

The following maps are also included in the volume:

(i) General maps of Great Britain and Ireland on a scale of 1/2,000,000 showing air stations, prohibited areas, air lights and unmasked marine lights.

(ii) Prohibited area maps on a scale of 1/126,720, showing the boundaries of prohibited areas.

B.—The Air Pilot Monthly Supplement

1. The publication of the Monthly Supplement to the first (1924) edition of *The Air Pilot* will cease with the next issue (No. 55).

2. With regard to the information concerning countries abroad which has already appeared in the Air Pilot Monthly Supplements pending the publication of Volume II of the new edition of *The Air Pilot* (see Section E below), information of a specially important nature (*e.g.*, regarding Corridors, Customs Stations and Prohibited Areas) will be issued in the form of a Notice to Airmen (see Section C below). With this exception, no further amendments to this information will be published.

3. A new series of supplements, entitled "The Air Pilot (Volume I) Monthly Supplement" will now be issued, the first number being published in September, 1929.

4. This monthly publication will contain amendments and additions to *The Air Pilot, Volume I*, and will be obtainable from H.M. Stationery Office, or 13*s.* 3*d.* post free from FLIGHT office, 36, Great Queen Street, Kingsway, W.C.2., at an annual subscription of 5*s.* net, post free, or at the price of 6*d.* net, post free, per single copy.

5. This series of supplements will continue until *The Air Pilot, Volume I*, is superseded by a third edition.

C.—Notices to Airmen

1. Printed Notices to Airmen are issued by the Air Ministry free of charge to all concerned with air navigation.

2. These Notices contain matter of an urgent nature, the publication of which cannot await the issue of the next Monthly Supplement, together with important information outside the scope of *The Air Pilot*, including amendments to the air maps mentioned in paragraph A2 above. As a temporary measure, important information regarding flight abroad will also appear in Notices to Airmen.

3. It is desirable that every pilot, whether licensed in Class "A" or Class "B," should see the Notices as soon as possible after issue, and, consequently, the Notices are given a wide distribution. Every aircraft-owner is supplied with a copy of each Notice for his own use and for the information of his pilots. The Notices are also distributed to officials of all public air stations, aviation clubs and associations, and to aircraft and aero-engine manufacturers. In the event, however, of any individual pilot not having easy access to Notices distributed through the normal channels, copies will be supplied direct to him upon application being made to the Secretary, Air Ministry (C.A. 3), Gwydyr House, Whitehall, London, S.W.1.

4. Subscribers to *The Air Pilot (Volume I) Monthly Supplement* who are not already in regular receipt of Notices to Airmen, will be supplied free of charge with future issues, provided that the request form, which will appear in the first Supplement, is completed and returned to the Secretary, Air Ministry (C.A. 3).

5. When desirable, specially urgent information will be broadcast by radiotelegraphy in advance of the printed notice. Such radio messages will be added at the end of the Air Ministry synoptic weather reports which are transmitted by Air Ministry radioelectric station on 4,100 metres C.W. at certain times. (See § 28 of *The Air Pilot, Volume I*).

D.—Relationship of the Above-named Publications

1. It should be understood that, for information relating to ground organisation and the conditions affecting flying in Great Britain and Ireland, *The Air Pilot, Volume I*, the Air Pilot (Volume I) Monthly Supplements and Notices to Airmen are complementary to one another.

2. Defined broadly, *The Air Pilot, Volume I*, is a compilation of information of a permanent nature, the Monthly Supplements will contain amendments and additions thereto, and Notices to Airmen will include matter of a temporary or specially urgent nature affecting *The Air Pilot*, such matter being incorporated, where still operative, in the following issue of the Monthly Supplement. The Notices will also contain information outside the scope of *The Air Pilot*.

E.—The Air Pilot—Volume II.

1. It is hoped to publish early in 1930, a second volume of *The Air Pilot*, entitled "The Air Pilot, Volume II, Europe (excluding Great Britain and Ireland)."

2. This volume will contain information relating to ground organisation and the conditions affecting the flight of British civil aircraft on the Continent. Further particulars regarding this volume will be published in due course.

(*No.* 43 *of* 1929)

Formation of Bubbles in Aircraft Compasses

In view of the fact that trouble has recently been experienced through the formation of bubbles in liquid compasses installed in Service and civil aircraft, the attention of all concerned is directed to the following report on this subject:—

"1. The presence of a bubble in a liquid compass renders the liquid liable to disturbance whenever the movement of the aircraft changes in any way. These movements of the liquid affect the magnet system and usually render the compass completely unreliable. For this reason it is essential that aircraft compasses should be constructed so that they will remain free from bubbles under all normal flying conditions.

2. The formation of bubbles may be due to any of the following causes:—

(*a*) Leaking at one or more places where joints have been made, *e.g.*, filling plug, verge ring, expansion chamber.

(*b*) Expansion chambers which are too small or too stiff to cope with the temperature range experienced.

(*c*) Inadequate de-aeration of the compass liquid before the bowl is finally sealed up.

3. Attention is particularly drawn to 2 (*c*) above, owing to the fact that alcohol normally holds in solution a considerable volume of air, and, if the pressure on the liquid is gradually decreased, some of this air will be liberated and will form a bubble. Such conditions occur when aircraft climb to high altitudes where the air pressure is low. Aircraft compasses should, therefore, be guaranteed by their makers to be free from bubbles if placed in a chamber in which the air pressure is reduced to 3 lbs. to the sq. in."

(*No.* 45 *of* 1929) *Use No.* 14 *Notice to Ground Engineer.*

AIR MINISTRY NOTICE TO GROUND ENGINEERS

Corrosion under Brass Identification Clips of Streamline Wires and Tie-Rods

(1) The attention of all ground engineers is directed to the fact that corrosion is found to take place under the brass identification clips of streamline wires and tie-rods.

(2) These parts, therefore, should be immediately examined by moving the clips from their position and should corrosion be found, the wire or rod must be replaced.

(3) Where frequent examinations are difficult, *e.g.*, within covered components, the wires and rods may be protected under the clips by a coating of good varnish, care being taken not to damage this protective coating when replacing the clips in their final position. If the clips are a slack fit, they should be lightly closed to prevent their sliding on to the unprotected parts of wires or rods.

(4) To prevent the above mentioned corrosion, new materials are being introduced for the clips on wires and rods of future manufacture.

(*No.* 13 *of* 1929.)

◈ ◈

British Airships Nearly Ready

THE R.101 and the R.100, the new British airships being built by the State and Commander Burney's company respectively, are now almost ready for early tests. It is estimated that within a month the R.100 will fly from Howden, E. Yorks, to Cardington, Bedford, whilst the R.101, which is being constructed at Cardington, is considered only a fortnight behind the R.100. September should see both ships in the air.

◈ ◈

In Praise of British Aircraft

SPEAKING at Eastbourne last Saturday, Sir Alan Cobham said that he was convinced that this country could produce the best aircraft and engines in the world, and that something in the character of British people made them the best pilots in the world, but this country had to prevent the same thing happening to the aircraft industry throughout the Empire as had happened to the automobile industry. Ninety-five per cent. of cars used in the Empire were foreign, declared Sir Alan

THE ROYAL AIR FORCE

London Gazette, August 13, 1929.

General Duties Branch

The following Pilot Officers on probation are confirmed in rank :—J. B. Mackenzie (May 9) ; H. C. Friday (May 25) ; B. W. Figgins, W. R. C. Wilkins (July 15) ; R. J. C. Hunt, J. C. L. Claxton, S. A. Davis, R. C. W. Ellison, D. L. Iremonger, C. N. McLoughlin, J. D. Robertson, H. E. Sales, N. W. A. Cullum (July 29). The following Pilot Officers are promoted to rank of Flying Officer :—H. B. Maugham (Jan. 8) ; C. E. St. J. Beamish, S. L. Blunt (June 17) ; W. F. Murray (July 9) ; E. N. V. Everett (July 13).

Flying Officer J. A. E. Inkster relinquishes his short service commn. on account of ill-health (Aug. 13). The short service comm. of the following Pilot Officers on probation are terminated on cessation of duty (Aug. 13) :—P. S. Hession, O. W. Hoffman.

Flight-Lieut. C. G. Hancock is dismissed the Service by sentence of General Court-martial (Aug. 1). Flying Officer D. S. Thomas is cashiered by sentence of General Court-martial (Aug. 1).

Stores Branch

Flying Officer H. J. Bamber is placed on retired list at his own request (Aug. 1).

Medical Branch

Major R. H. Bebb, O.B.E. (Army Dental Corps), is granted a temp. commn. as Squadron Leader (Dental) on attachment to R.A.F. (Aug. 1) ; Flight-Lieut. A. B. H. Cole (Capt. Army Dental Corps) relinquishes his temp. commn. on return to Army duty (Aug. 1).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The following are granted commns. in Class A.A. (ii) as Pilot Officers on probation :—C. M. Dransfield, P. A. Jessel (July 26) ; E. M. Wright, G. B. Rahr (July 29) ; Pilot Officer on probation G. Nelson is confirmed in rank (July 21) ; Pilot Officer E. M. S. Spence is promoted to rank of flying Officer (Aug. 6).

The following are transferred from Class A.A. (ii) to Class C :—Flying Officer J. M. Greenwood (June 24, 1928) ; Pilot Officer on probation C. F. Morris (Aug. 9). Flying Officer A. G. Moon is transferred from Class A to Class C (June 1) ; Flying Officer A. H. Barnard is transferred from Class B to Class C (Aug. 7).

The following relinquish their commns. on completion of service :—Flight-Lieut. M. D. Nares, A.F.C. (July 26) ; Flying Officer S. Turner, D.F.C. (July 13).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Group Captains : F. K. Haskins, D.S.C., to Air Ministry (A.M.P.). On appointment Deputy Director of Postings, 12.8.29. C. H. K. Edmonds, D.S.O., O.B.E., to Station H.Q., Worthy Down, to command, 6.8.29. S. Smith, D.S.O., A.F.C., to No. 2 Flying Training Sch., Digby, to command. On transfer to Home Estabt., 2.8.29.

Wing Commanders : R. Collishaw, D.S.O., O.B.E., D.S.C., D.F.C., to H.M.S. "Courageous." For duty as Senior R.A.F. Officer, 2.8.29. G. H. Bowman, D.S.O., M.C., D.F.C., to H.Q., Inland Area, for Air Staff Duties, 9.8.29.

Squadron Leaders : G. H. Hall, A.F.C., to R.A.F. Training Base, Leuchars, 5.8.29. R. S. Lucy, A.F.C., to No. 101 Sqdn., Bircham Newton, 9.7.29.

Flight Lieutenants : F. E. Vernon, to Home Aircraft Depot, Henlow, 6.8.29. A. F. Scroggs, to School of Photography, S. Farnborough, 6.8.29. G. R. M. Clifford, to No. 406 Flight, Donibristle, 23.7.29. E. J. L. Hope, A.F.C., to R.A.F. Depot, Uxbridge, 24.7.29. H. L. Beatty, to R.A.F. Base, Calshot, 29.7.29. S. D. Scott, to Sch. of Naval Co-operation, Lee-on-Solent, 6.8.29. J. A. Teasdale, to Home Aircraft Depot, Henlow, 10.8.29. J. R. D. Goadsby, to R.A.F. Base, Gosport, 29.7.29.

Flying Officers : G. W. Hayes, to Home Aircraft Depot, Henlow, 12.7.29. F. S. O'Hanlon and A. C. Danbury, to Home Aircraft Depot, Henlow, 11.7.29. C. H. Hockly, to Armoured Car Wing, Iraq, instead of to No. 6 Sqdn., Iraq, as previously notified, 19.4.29. H. J. J. Jagger and P. MacG. Watt, to No. 1 Flying Training Sch., Netheravon, 7.8.29. F. W. Moxham and H. E. Power, to No. 2 Flying Training Sch., Digby, 7.8.29. A. P. Bett, to No. 3 Flying Training Sch., Grantham, 7.8.29. J. Norwood, to No. 5 Flying Training Sch., Sealand, 7.8.29. E. S. Finch and J. W. Gillan, to R.A.F. College, Cranwell, 7.8.29. B. E. Moody, to No. 501 Sqdn., Filton, 7.8.29. P. J. Hayes, M.B.E., A.F.C., to Marine Aircraft Experimental Estabt., Felixstowe, 24.7.29. C. A. Pearson, to Night Flying Flight, Biggin Hill, 23.7.29. J. H. Powle, to Home Aircraft Depot, Henlow, 13.7.29.

Pilot Officers : J. G. W. Weston, to No. 207 Sqdn., Eastchurch, 30.7.29. E. J. Laine, H.M. Pearson and K. R. Coates, to No. 201 Sqdn., Calshot, 31.7.29. J. D. Rutherford, to No. 204 Sqdn., Cattewater, 31.7.29. D. T. Shelley and F. C. Sturgiss, to Marine Aircraft Experimental Estabt., Felixstowe, 31.7.29

Accountant Branch

Flight Lieutenant : W. E. Fisher, M.C., to R.A.F., Record Office, Ruislip, 3.8.29.

Flying Officers : T. C. Reep, to No. 3 Stores Depot, Milton, 26.8.29. M. L. Jones, to Sch. of Balloon Training, Larkhill, 29.7.29.

Medical Branch

Flight Lieutenant : P. D. Barling, M.B., to R.A.F. Hospital, Cranwell, 4.8.29.

PERSONALS

Married

JAMES BIRD, Sqd. Commander, R.N. (Retired) was married on August 10, in London, to YOLANDA CLAIRE, twin daughter of Mr. and Mrs. E. L. BECKINGHAM, of Tynemouth, Northumberland. Commander Bird, who is a director of Vickers (Aviation) Ltd., and the Supermarine Aviation Works, Ltd., is Vice-Chairman of the Royal Aero Club Schneider Committee.

FLIGHT.-LIEUT. GABRIEL MARIE ANTOINE DE RUTY, Chevalier de la Légion d'honneur, Croix de Guerre, eldest son of Comte and Comtesse de Ruty of Paray le Monial (Saone et Loire), France, was married on August 6, at Vöcklamarkt ob. österreich, to MARJORIE PRIMROSE AUGUSTA WETHERED, only child of the late Oliver Wethered, of Edgcote House, Claygate, Surrey.

On July 25, GEOFFREY ARTHUR HENZELL PIDCOCK, Flight-Lieut., R.A.F., was married to EVELYN CATHERINE WATKIN, of 35, Moore Street, S.W.3.

The marriage took place on August 10, at St. Mary's Church, Kippington, of Capt. ARTHUR W. VIGERS, M.C., D.F.C., youngest son of Mr. and Mrs. Vigers, of Montville, Guernsey, to MARJORIE FRANCES, eldest daughter of Mr. and Mrs. CHAS. H. VIGERS, of Kippington House, Sevenoaks.

The marriage took place at Littleham Parish Church on August 14, of FLYING OFFICER ELLACOTT LYNE STEPHENS WARD, R.A.F., only son of Lieut.-Col. E. L. Ward, I.M.S (ret.), and Mrs Ward, of Sidcup, Kent, and Miss Sylvia Etheridge, eldest daughter of Lieut.-Col. F. Etheridge, 7th Rajput Regt., and Mrs. Etheridge, of Exmouth.

The marriage took place quietly at Roquebrune, Cap Martin, France, on August 12, of LEO PARCUS, COUNT VON ZEPPELIN, and AMETHE MCEWEN, daughter of the late DONALD SMEATON, C.S.I., M.P.

To be Married

The engagement is announced between GEOFFREY MUNGO BUXTON, R.A.F., eldest son of the late Commander Bernard Buxton, D.S.O., R.N., and the late Lady Hermione Buxton, and HORATIA MARY, younger daughter of Vice-Admiral Sir WILLIAM FISHER, K.C.B., C.V.O., and Lady Fisher.

The marriage arranged between CHARLES EDWARD SCOTT, M.C., R.A.F., late Sherwood Foresters, third son of the late Mr. James Scott, of Dublin, and Mrs. Scott, and KATHLEEN MAY, only daughter of Mr. A. WHARTON BIRCHAM TOPPS, King's Lynn, will take place at Karachi on October 3.

A marriage has been arranged, and will take place quietly in October between FLIGHT-LIEUT. T. J. DESMOND, R.A.F., and ELSIE, only daughter of the late Col. and Mrs. FRASER, of White Cottage, E. Cowes, I.W.

A marriage has been arranged, and will shortly take place, between H. DESMOND GUNTON, formerly R.A.F., only son of Maj. and Mrs. H. C. Gunton, of Rathgar, Gerrards Cross, Bucks, and GWEN, only daughter of Mrs. CHARLES BROOKS, Gold Hill, Chalfont St. Peter, Bucks.

The engagement is announced between CHARLES FREDERICK HALLY-BURTON GRACE, R.A.F., son of the late Maj. C. H. Campbell Grace, Indian Army, and IRENE MARY, elder daughter of Mr. and Mrs. J. ROLAND HEWITT, of Foxhall, Ipswich.

The engagement is announced between GERALD DAVIES (late Capt., R.A.F.), of 63, Harrington Gardens, S.W.7, youngest son of the late Mr. and Mrs. G. F. Davies, and MARGARET, younger daughter of Maj. and Mrs. J. T. BAVIN, of Berkhamsted, Herts.

The engagement is announced between Capt. R. F. MILLARD, late 3rd Border Regt., and R.A.F., eldest son of the Rev. F. L. H. and Mrs. Millard, St. John's Vicarage, Brixton, London, and HARIOT (HARRIE), daughter of Mr. and Mrs. J. SOUTTER CLAYTON, Oakfield, Upton Heath, Chester.

Royal Air Force Memorial Fund

THE usual Meeting of the Grants Sub-Committee was held at Iddesleigh House, on August 8. Lieut.-Commander H. E. Perrin was in the chair, and the other member of the committee present was Mr. W. S. Field.

The committee considered in all 10 cases, and made grants to the amount of £122 3s.

The next meeting was fixed for August 22, at the offices at 2.30 p.m.

R.A.F. Short Service Officers Wanted

THE Air Ministry states that during the next few months about 100 officers will be required by the Royal Air Force for flying duties under the short service commission scheme. Applications are accordingly invited from well educated candidates of good physique who are between the ages of 18 and 25.

Selected candidates are required to appear before the Interview and Medical Board at the Air Ministry, London. If accepted they are granted short service commissions for 5 years' service on the active list and 4 years on the reserve.

During their period of service short service officers have opportunities and facilities for study with a view to preparing themselves for civil life and assistance is given to them in seeking employment when they pass to the reserve. A competitive examination is also held annually and from this a limited number of short service officers are appointed to specialist courses in engineering, wireless telegraphy, armament, etc., with a view to obtaining permanent commissions in the Royal Air Force. About twenty appointments to medium service are also offered annually to short service officers, *i.e.*, to serve for a second period of five years on the active list. During this period, however, they are ineligible for the grant of a permanent commission.

Accepted candidates enter as pilot officers on probation with pay of about £273 a year increased on promotion to flying officer, normally after 18 months' service, to about £343. Officers also receive free quarters, rations, fuel and light, etc., or where these are not available, cash allowances in lieu amounting at present to about £141 a year. On joining for duty officers with no previous service in His Majesty's Forces, receive an outfit allowance of £50. A gratuity of £375 is payable on termination of 5 years' service on the active list ; a gratuity of £1,000 to medium service officers on termination of 10 years' service on the active list ; and retired pay according to length of service and rank attained to officers granted permanent commissions.

Application forms and full details of the conditions of service can be obtained from the Secretary, Air Ministry, Kingsway, London, W.C.2.

CORRESPONDENCE

THE RAILWAYS' ROAD TO PROSPERITY

[2201] ONE views with serious misgivings the downhill trend of railways from a financial point of view. It seems to me that railways in the near future have potential advantages that will mean a great deal from a monetary point of view to them in a short time.

The point I have in mind is the fact that railways have in the big acreage covered by their stations, places like King's Cross, Euston, Victoria, etc., large open spaces which, if covered over with great landing stages, could be made centres for the arrival and departure of aircraft, and remember, the only open spaces big enough for the purpose left in London.

There is little or no chance of any other method of flying from the centre of London. Some railways have recently taken powers to use aeroplanes, and I think they have in their station areas a potential gold mine, and it will be only a matter of a very few years before all the long-distance passenger traffic will be taken in aeroplanes and the stations roofed over with a flat landing stage on which aeroplanes can land and depart.

Thames Ditton, Surrey. S. F. EDGE
August 7.

A DOPING QUESTION

[THE following letters when received were submitted to Messrs. Titanine-Emaillite, Ltd., for their reply in order that query and answer might appear simultaneously, the latter also being therefore found hereunder.—ED.]

[2202] We note that in this week's issue of FLIGHT you have advertised on page 17 that "Titanine Dopes" were used on Saunders' productions. We think it only fair to point out that our machine was finished with Cellon and Cerric. G. PRICHARD
August 2, 1929. (S. E. SAUNDERS, LTD.)
East Cowes

[2203] We have noted from the advertising matter in the current issue of FLIGHT a reference to the dope used by various exhibitors at the Aero Show, and we would like to state here that with regard to our own exhibit the "Gadfly" light aeroplane, the only finish that has been applied is Cerric Lacquer.

We would be pleased, if such is possible, for you to give publicity to above since some confusion has arisen due to the double page advertisement giving plan of Aero Show and the users of a certain dope, and there having already appeared a similar advertisement by another manufacturer of dope, and ourselves appearing in each advertisement.

We certainly have used dopes by the two manufacturers, but as already pointed out, our exhibit was finished with Cellon materials, and which material by the way we have standardised for the "Gadfly" machines.

For and on behalf of Glenny and Henderson,
WILLIAM A. BAKER, Works Manager.
August 6, 1929.
Byfleet, Surrey.

Messrs. Titanine-Emaillite, Ltd.'s replies

[2204] We are in receipt of your letter of August 7, enclosing copy of letter you have received from Messrs. Glenny and Henderson. We can only say in reply that their letter conflicts in no way with what we advertised.

Incidentally we had no knowledge that they have now standardised competitive materials for the "Gadfly" machines.

175, Piccadilly. For TITANINE-EMAILLITE, LTD.,
August 9, 1929. F. GRAINGEDY, Secretary.

[2205] In reply to your letter of August 3 regarding our advertisement in FLIGHT, in which we give a list of manufacturers showing at the Aero Exhibition who employ "Titanine," we would say that up to a few weeks of the time of publishing the advertisement, Messrs. Saunders had been our regular customers. We received orders from them up till the end of June and records show that actually ten different orders for various materials were supplied to them during May and June.

The answer to their letter is that our advertisement did not say that their machine which was shown at the Aero Exhibition was finished with "Titanine" and we suggest that you refer them to the actual wording of our advertisement, for we see that they say in their letter that we had advertised that "Titanine Dopes were used on Saunders' productions," which is going a little further than our statement.

For TITANINE-EMAILLITE, LTD.,
175 Piccadilly. F. GRAINGEDY, Secretary.
August 9, 1929.

MALCOLM CAMPBELL (LONDON), 1927, Ltd., have sold the following new Gipsy-Moths: G-AAKX, to Group Capt. J. E. Baldwin, D.S.O., Central Flying School; G-AAIM, to Capt. Shaw, Shell-Mex, Ltd.; G-AAJV, to Lieut.-Comdr. Glen Kidston; G-AAJR, to the Hampshire Aero Club; G-AAKW, to Mr. Irvin, the Irvin Air Chute Co., Ltd.; G-AAKF, to Mr. H. Armstrong, of New Zealand; G-AAKD, to Mr. A. Methley, of Birmingham; G-AAJN, to Mr. Leslie F. Horne, of London; G-AAJU, to the late Capt. G. F. Boyle; G-AAFL, to Mr. T. O. Mills, of Bournemouth; and another Gipsy Moth to Mr. A. H. Downes Shaw, of Bristol. The following are second machines sold:—Cirrus Mark II Moths, G-EBQE, to Comte A. Costarde Beauregarde, France; G-AABH, to Col. G. P. L. Henderson; G-EBTI and G-EBRX, to the Brooklands School of Flying; G-EBWY, to the London Aeroplane Club; Pre X Mark II Moth G-EBST, to Mr. W. G. Andrews, of Sunbury; and Gipsy Moth G-AADP, to the Household Brigade Flying Club. All the second-hand machines were sold in part exchange for new or second-hand machines.

K.L.G. Success

FOR the Indian flight of the Duchess of Bedford in the monoplane "The Spider," piloted by Capt. C. D. Barnard, the Bristol "Jupiter" engine was fitted with K.L.G. plugs.

Luxor Goggles for Schneider Pilots

THE Air Ministry recently ordered five pairs of the new Luxor Acetex goggles, model No. 6, for the members of the British Schneider Trophy team. Luxor goggles were also supplied for two previous Schneider Trophy teams.

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IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910.)

For 1910 and 1911 figures see FLIGHT for January 25, 1912.
For 1912 and 1913, see FLIGHT for January 17, 1914.
For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1927 being given in FLIGHT, January 19, 1928.

	Imports.		Exports.		Re-exports.	
	1928.	1929.	1928.	1929.	1928.	1929.
	£	£	£	£	£	£
Jan.	.. 1,220	2,852	157,598	74,307	330	100
Feb.	.. 1,772	6,532	118,622	195,369	345	2
March	.. 4,805	1,210	125,901	204,664	1,307	902
April	.. 2,904	5,816	134,126	186,477	3	115
May	.. ?,513	4,706	118,804	243,549	640	1,245
June	.. 5,916	9,304	86,245	144,817	1,317	750
July	.. 2,025	6,961	108,746	139,695	521	—
	21,155	37,381	850,042	1,188,878	4,463	2,302

* * * *

NEW COMPANY REGISTERED

ROBINSON AIRCRAFT CO., LTD., 44, Bedford Row, W.C.1.—Capital £100, in £1 shares. Mechanical and aeronautical engineers, manufacturers of aircraft, etc. Directors, R. C. Bartlett (governing director), 53A, Holland Park, W.11. Capt. P. G. Robinson (managing director, "Seacroft," Salisbury Road, Carshalton, Surrey.

* * * *

AERONAUTICAL PATENT SPECIFICATIONS

(*Abbreviations*: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1928

Published August 22, 1929

5,740. GOODYEAR-ZEPPELIN CORPORATION. Stabilizing-apparatus for airships. (289,040.)
11,854. W. T. CADDY and D. DOIG. Petrol tanks for aeroplanes, etc. (316,117.)
14,014. L. PEYRET. Control surfaces for aircraft. (290,300.)
15,110. SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT, LTD., and F. M. GREEN. Airscrews. (316,373.)
15,751. H. I. BIRDS and C. W. JOHNSTONE. Automatic variable-pitch airscrews, etc. (316,374.)
18,750. SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT, LTD., F. M. GREEN, and J. LLOYD. Control members for aircraft. (316,395.)

FLIGHT.

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone: Holborn 3211.
Telegraphic address: Truditur, Westcent, London.

"FLIGHT" SUBSCRIPTION RATES

UNITED KINGDOM			ABROAD*		
	s.	d.		s.	d.
3 Months, Post Free	7	7	3 Months, Post Free	8	3
6 " "	..15	2	6 " "	..16	6
12 " "	..30	4	12 " "	..33	0

* *Foreign subscriptions must be remitted in British currency.*

Introduction